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ABSTRACT

This report is the result of a meeting to consider the need for broad assessment of the fundamental changes in library and information services needed to keep pace with the electronic age. Participants agreed to plan for the establishment of an annual series of policy forum meetings for participants from a variety of disciplines to consider issues and developments in library and information services data needs. The forum focused on four papers addressing critical issues facing library and information services: (1) "Measuring the Impact of Technology on Libraries" (Martin Dillon); (2) "Multitype Library Collaboration: Measures of Implicit Impact" (Mary Treacy Birmingham); (3) "Information To Enhance Planning for Education for Library and Information Services Professionals: What Do We Need To Know?" (June Lester); and (4) "Statistical Support for Urban Library Services" (Eleanor Jo Rodger). Two appendices present a news release about the forum and an excerpt from "Libraries at Large," a 1969 publication of the Federal Institute of Library and Information Science. (SLD)

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ED 376 816

LIBRARY AND INFORMATION SERVICES POLICY:

A FORUM REPORT

Sponsored by the

National Center for Education Statistics
U.S. Department of Education

and the

U.S. National Commission on Libraries and Information Science

September 23–24, 1993

Washington, D.C.

U.S. National Commission on Libraries and Information Science
1110 Vermont Avenue, N.W.
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Washington, D.C. 20005-3522

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Preface

Publication of this Forum Report represents another stage in the fruitful collaboration between the National Center for Education Statistics and the U.S. National Commission on Libraries and Information Science. Following are some of the specific achievements by these two agencies since 1988:

1. Development of the Federal–State Cooperative System (FSCS) for Public Library Data and production of annual national survey reports of descriptive statistics of public libraries with the cooperation of 50 State Library Agencies and D.C. and public libraries using standard software for reporting, editing, and publishing the data;

2. Completion of two biennial collections of national academic library data using cooperatively developed standard software and the assistance of Library Representatives in each of the States;

3. Incorporation of the collection of important added data on school library media centers and services in the comprehensive NCES Schools and Staffing Survey;

4. Initiation of a national State Library Agency Survey and a Federal Library Survey;

5. Development of a nation–wide Public Library Universe file from which valid, reliable samples can be drawn; and

6. Support and assistance in the development of a national sample survey of Public Libraries and Internet.

Along with the remarkable progress in the collection and publication of basic library data has been the growing realization by Honorable Emerson Elliott, NCES Commissioner, and Peter Young, NCLIS Executive Director, and their key staff members, that a broad assessment of the fundamental changes in library and information services is needed, perhaps on an annual basis, to ensure that data continue to meet the needs of research and policy determination in the field of library and information services which impacts on every resident of the United States, its Territories and the Indian Nations..

This Forum Report is the result of the first meeting to consider the need for such a broad assessment on a continuing basis. The Forum focused on four papers addressing critical issues currently facing library and information services. These papers served as discussion to assist in the group formulation of recommendations for the next steps which will be taken toward the improvement of data relating to library and information services in the interest of social and economic development at community, State, and national levels.

Thanks go to those who participated in the Forum, those who authored the papers, and those at NCES and NCLIS who formulated this event.

John G. Lorenz, Coordinator
Library Statistics Program
U.S. National Commission on Libraries
and Information Science

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I. EXECUTIVE SUMMARY

A. Objectives of the Forum

Emerson Elliott, Commissioner, National Center for Education Statistics, stated the purpose of the meeting: To plan for the establishment of an annual series of policy forum meetings involving participants from a variety of different disciplines (e.g. statistics, libraries, information services, research, economics, political science, etc.); and to consider library and information services data needs, specifically relating to current urgent issues and developments in library and information services as a backdrop for Forum planning. Participants at these policy forum meetings will discuss library data needs for all types of libraries, consider some of the societal urgent issues and developments that face library and information services over the next five years, and work together to contribute to the collection, analysis, and dissemination of data useful for research and the development of public policies related to library and information services.

If the group determines that there is value as a continuing group in the holding of future forums, discussion topics should include: (1) determining objectives, participation, and agenda; (2) expanded representation; and (3) how best to involve representatives of other disciplines and fields, e.g., educators, economists, political scientists, sociologists, government representatives.

Several specific purposes of the forums are to:

(1) Look at how data are actually used for decision-making at local, State, and national levels. How do decision-makers use data for policy decisions? Do they understand the potential for using the data? Satistics will often cause people to use information differently and to ask more sophisticated questions.

(2) Help to identify ways in which decision-makers currently make decisions about libraries and how they can better be served by use of up-to-date statistics.

(3) Determine where you need to interrelate different types of data (e.g., demographic, crime, and employment data).

(4) Help to think about pooling resources. Who are the other entities that should share in joint projects in support of forum objectives.

B. Summary of Remarks

Emerson J. Elliott, Commissioner, National Center for Education Statistics, U. S. Department of Education

Commissioner Elliott provided background information on the National Center for Education Statistics, the Library Statistics Program, and the Federal-State Cooperative System for Public Library Data. The purpose of the Center is to collect, analyze, and disseminate statistics and other data related to education in the United States and in other nations. FSCS is a cooperative system through which the 50 States and D.C. submit individual public library data to NCES on a voluntary basis in machine-readable format. At the State level, FSCS is administered by State Data Coordinators, each one appointed by the Chief Officer of the State Library Agency.

With the urgent issues and developments that face library and information services over the next five years and the rapidly increasing use of technology in libraries, where do we go from here? The field has changed so much that you cannot even begin to envision what a library will look like 10 or 20 years from now. Decisions must be made about what we are learning regarding new technology. Libraries are constantly being redefined. What is it policy makers must know to make important decisions about libraries? THIS IS WHERE A FORUM COMES IN! We must get to the next level of information for delivering library service, and we want to bring in other disciplines to broaden the context. We should look at other sources out there and their potential contributions.

Peter R. Young, Executive Director, U.S. National Commission on Libraries and Information Science

Mr. Young, said, "This meeting represents the fulfillment of the hopes, plans, and expectations of many people."

He also stated, in part, "...Improving the library national data-machine requires more than tuning and maintenance. The machine needs to evolve according to the different routes that are appearing on the changing library and information services landscape. If we have a great library-data reporting, collection, and dissemination engine that concentrates on the wrong statistics, it's of little use to library managers, researchers, policy planners, or to the industry serving this marketplace. The hope and promise of this Forum is that ideas will emerge which will provide direction and shape for the future. Direction needs to be determined for both the library statistics program and for the library, research, and information services communities. The nature of the cooperative effort between NCES, NCLIS, State libraries, and local libraries needs to be extended to this group which is considering the development of public policies."

Mr. Young described the policy maker's need for descriptive statistics in making 'tomorrow's' decisions.

NCLIS' involvement and interest in improving library and information services statistical systems results from the statement of responsibilities included in their 1970 enabling statute (Public Law 91-345):

- "conduct studies, surveys, and analyses of the library and information needs of the Nation...and the means by which these needs may be met...."
- "appraise the adequacies and deficiencies of current library and information resources and services and evaluate the effectiveness of current library and information science programs."

Mr. Young concluded, "In 1970 these functions were a dream. In 1993, hopefully, with the group assembled here today, these are more than dreams in terms of moving the forum participants into the area of policy that the Commission's primary advisory function calls for."

C. Brief Notes on the Four Forum Papers

The following three introductory background papers on critical issues and changes facing library and information services were discussed:

(1) Measuring the Impact of Technology on Libraries by Martin Dillon, Director, Library Resources Management Division, OCLC. A summary of the impact of technology, particularly electronic, on academic, public, and school library media services to date.

(2) Multitype Library Collaboration: Measures of Implicit Impact by Mary Treacy Birmingham, Director, METRONET. A summary of types of interlibrary cooperation and resource sharing and the entities that provide this function, sometimes called systems, cooperatives, federations, and networks.

(3) Information to Enhance Planning for Education for Library and Information Services Professionals: What Do We Need To Know? by June Lester, School of Library and Information Studies, University of Oklahoma. A summary of information available and data needed to plan for education and training programs for library and information service professionals over the next five-year period.

In addition, the following paper on the urgent economic problems being faced by many urban public libraries and their need for financial and statistical support was discussed:

(4) Statistical Support for Urban Public Library Services by Eleanor Jo (Joey) Rodger, Executive Director, Urban Libraries Council. An example of a type of library with urgent problems and a need to demonstrate factually and graphically their economic and/or educational impact on their communities.

D. Summary of Remarks by Guest Speakers

Guest speakers at the Forum luncheon were the Honorable Sharon Porter Robinson, Assistant Secretary, Office of Educational Research and Improvement, U.S. Department of Education, and Professor Charles McClure, Syracuse University's School of Information Studies, now serving as NCLIS Distinguished Researcher.

Sharon Porter Robinson, Assistant Secretary, Office of Educational Research and Development, U.S. Deparrtment of Education

Ms. Robinson stated that she was pleased to note the creativity, time, intellect, and energy the participants are devoting by helping to design a data base that supports decision-making in library and information services. "We really do have to find ways to creatively, in a short amount of time, advance our public interest and intellectual interest through a real policy agenda that will embrace the needs and requirements of all types of libraries so that we can provide a rationale for the service that libraries must offer."

Ms. Robinson stated that in moving into an environment of documenting, validating, and showing impacts, collecting the appropriate data and providing access to that data becomes essential to the success of our work. "How do we prepare for the future, and what is the more desirable future we want to create? she asked. "We prepare for the future by becoming real good learners, real good at accessing information, real good at analyzing circumstances, and real good at deciding what is in our best interest. We have to create a broader community of interest and be able to show the difference we are making."

Charles McClure, NCLIS Distinguished Researcher

Professor McClure stated that the time has come when specific data for policy and decision-making relating to library and information services is urgently needed. For example, he stated, the role of libraries in the Internet and the role of the Government Printing Office are two important library and information services policy issues that will be before the next Congressional session.

"What are the key policy questions that we need to address?" he asked. "We need a fleet-footed, quick-response, policy research SWAT team. We want not only data, but a policy analysis of the data. Here it is 1993, and we in the library and information service field do not have a formal organization/institute/unit that handles policy work. We need a group of committed, on-going individuals with a policy institute mentality....I am ready and willing to start talking about the Policy Institute for Library and Information Studies, and I am ready to look for some cooperative ways to get it going. I believe there are common interests in policy issues between ALA, ARL, SLA, library educators, etc. This is an idea whose time came 25 years ago. But, we shouldn't look for one organization to establish the Institute; we should look for a cooperative arrangement. We have to be able to take a better policy perspective of how the data can be used in a larger policy-making environment."

E. Summary of Forum Recommendations

The participants agreed that the work of the Library and Information Services Policy Forum should proceed and discussed the objectives for future annual Forums. Mr. Paul Planchon, Associate Commissioner, Elementary/Secondary Education Statistics Division, NCES, and Forum Chair and Organizer for the final session, outlined future Forum topics, as suggested by the participants:

- How to educate the "information handlers" of the future:
    - Retraining needs
    - Tracking minority librarians
    - Role of librarians in the electronic future
    - Need for and impact of distance learning

- Contributions of library and information services to:
    - Economic competitiveness
    - Methodology for determining economic impact
    - Inventory of services
    - Costing methodologies
    - Conceptual analysis of "economic vitality"

- Impact of technology:
    - Critical variables to measure in the evolution to an electronic world
    - Need for an institute for research and statistics for library and information policies

The Forum participants agreed that two key questions to be asked are: (1) What difference does a library make to a community?; and (2) What is the economic value of information provided by libraries?

Several recommendations were proposed as focus topics for future annual Forums:

(1) That specific and urgent policy issues facing library and information services be identified on which research and statistics can contribute policy assistance and resolution;

(2) That the idea for a research institute* be pursued as a cooperative effort; and

(3) That economic models and studies be identified and/or developed that will measure the impact of library and information services on economic competitiveness.

(4) That future annual forum participation be broadened to include professionals from other fields, e.g., educators, sociologists, economists, political scientists, and government representatives from other national agencies.

The participants agreed on the following topic for the 1994 Forum:

SHAPING PUBLIC POLICY
FOR LIBRARY AND INFORMATION SERVICES
THROUGH RESEARCH AND STATISTICS:
1994 THROUGH 1998

*** Appendix II describes a Federal Institute of Library and Information Science as recommended by the National Advisory Commission on Libraries in the Publication, Libraries at Large, 1969.**

II. LIST OF PARTICIPANTS

Library and Information Services Policy Forum
September 23 – 24, 1993
Washington, D.C.

Mary Treacy Birmingham, Director, METRONET
Tobi Brimsek, Assistant Executive Director, Special Libraries Association
Eileen Cooke, Director, American Library Association Washington Office
Blane Dessy, Supervisory Program Analyst, Office of Research, Office of Educational Research and Development (OERI), U.S. Department of Education (ED)
Martin Dillon, Director, Library Resources Management Division, OCLC
Emerson Elliott, Commissioner, National Center for Education Statistics (NCES), OERI, ED
Ray Fry, Director, Library Programs, OERI, ED
Gordon Green, Chief, Governments Division, Bureau of the Census
Carrol Kindel, Chief, Library Statistics Branch, NCES, OERI, ED
June Lester, Director, University of Oklahoma School of Library & Information Studies, (representing ALISE)
John G. Lorenz, Coordinator, Library Statistics Program, U.S. National Commission on Libraries and Information Science (NCLIS)
Mary Jo Lynch, Director, Office of Research and Statistics, ALA
Eric Massant, Congressional Information Service (representing Information Industry Association)
Charles McClure, NCLIS Distinguished Researcher, School of Information Studies, Syracuse University
Lotsee Patterson, University of Oklahoma School of Library & Information Studies, (representing American Indian Library Association)
David Penniman, President, Council on Library Resources
Paul Planchon, Associate Commissioner, Elementary/Secondary Education Statistics Division, NCES, OERI, ED
Mary Alice Hedge–Reszetar, Associate Executive Director, NCLIS
Dennis Reynolds, President (Regional Network System), CAPCON
Eleanor (Joey) Rodger, Executive Director, Urban Libraries Council
Elinor Swaim, Vice Chairman, NCLIS
Duane Webster, Executive Director, Association of Research Libraries
Barratt Wilkins, Chief Officer, State Library of Florida (representing Chief Officers of State Library Agencies)
Peter R. Young, Executive Director, NCLIS
Douglas Zweizig, School of Library and Information Studies, University of Wisconsin

Guest Luncheon Speakers

Charles McClure, NCLIS Distinguished Researcher, School of Information Studies, Syracuse University
Sharon Porter Robinson, Assistant Secretary, Office of Educational Research and Improvement, U.S. Department of Education

Observers

Adrienne Chute, NCES
Elaine Kroe, NCES
Larry LaMoure, Consultant
Barbara Perry, World Bank
Barbara Whiteleather, Special Assistant and Recording Secretary, NCLIS
Jane Williams, NCLIS
Jeff Williams, NCES

III. MEASURING THE IMPACT OF TECHNOLOGY ON LIBRARIES

A discussion paper
presented for discussion
by participants in
the Library and Information Services Policy Forum

Washington, D.C.

September 23-24, 1993

by

Martin Dillon

Director, Library Resources, Management Division

OCLC

Measuring the Impact of Technology on Libraries

1. Preamble

A panel of distinguished librarians was discussing the social impact of the information revolution. Someone in the audience asked how one could tell when the revolution was completed. A panelist responded, "When a patron of a public library can get the equivalent of a Harvard education through multimedia courses delivered on the library's equipment." This prompted a second panelist to remark, "By then, it won't be necessary for the public library to offer such facilities; they will be available in the home."

There are one or two interesting points to this exchange. Foremost is the question it raises of how we can monitor changes that are occurring broadly in the evolution of institutions, in this case the library with respect to a vague concept labeled the "information revolution." The fact is that revolutions, even metaphoric ones, usually leave tracks through which their progress can be charted. Whether the event stipulated by the panelist as a signal of this revolution's completion can be accepted—when a patron can get the equivalent of a Harvard education in a public library—it should be possible to express what this revolution is in terms that can be observed and quantified. Perhaps our first panelist would accept a modest restatement : "When 50% of public libraries surveyed report owning the materials and delivery equipment for such a course."

The remark by the second panelist is also of interest. It implies that a day will come when all our information needs will be met through devices in the home, perhaps bypassing libraries altogether. Again, it is helpful to translate the concept into something observable and quantifiable. When will 50% (90%?) of the homes in the U. S. be equipped to receive multimedia documents? An advantage to posing the question thusly is that a satisfactory answer can be determined through a simple survey. Moreover, progress toward achieving the specified goal can be charted. This suggests an additional point about trends generally that is important in this context. While it is clear that 50% of our homes will one day be equipped with multimedia, it is also clear that a substantial gap will always exist between those who are provided with such facilities early in the technology cycle, and those who gain access to them much later. Students at MIT or Stanford will always be using the newest technology decades before the disadvantaged glimpse it. Indeed, one might argue that it is the function of the public libraries to fill that gap to the extent that we provide them funds to do so.

This simple story captures for me some of the important issues in gathering and analyzing statistics about libraries. The shift from paper to digital form as the dominant medium for representing knowledge will entail major changes in our paper based institutions. How can we anticipate those changes? Gauge their pace, their impact? Plan for the inevitable transformations that will occur in our institutions, professions and personal lives? Finally, what statistics should we gather that will help us answer these questions?

We are living early in the age of electronic information, part way through a revolution that will have enormous consequences for our culture, society and particularly the information professions—publishing, education, research, scholarship, and libraries. Our concern here is with libraries, but before considering how this revolution will affect libraries, it is useful to start with some general observations about where we are and where we've come from.

2. Statement of the Problem

University Libraries and Scholarly Communication is a remarkable study prepared for the Andrew W. Mellon Foundation and published in 1992. According to the study's Foreword, "a principal objective of this research has been to describe the library landscape as it appears today, in its collecting, operating, financial, and electronic dimensions." [Cummings, 1992 p. ix] Two quotations from this study represent the clearest statement of the problems facing the library community. The first articulates the relation between libraries and the print medium:

> The characteristics of print therefore have had profoundly important implications for the storage and dissemination of information, including scholarly information, and thus for the most fundamental aspects of the processes of scholarly activity and communication. The essential distinguishing characteristics of research libraries are themselves expressions of the technology of print. [p. 106]

To a lesser extent this claim can be made for libraries of all types—most academic libraries certainly, public and school libraries less so but still largely, and special libraries least of all. But all are more or less bound to the medium that originally gave rise to them. A second quote clinches the matter:

> The information technologies of the late 20th century compel us to rethink the most basic assumptions underlying the processes of research and scholarly communication. [p. 107]

This paper deals with the possibility of tracking the movement that is underway in the library world as a consequence of the pressures alluded to in the above statements. The focus is on statistics—what things should we count that tell us where we are and where we are going? These statistics are important for two general sets of reasons. First, they help us see the broader, national picture, a view that is necessary for policy makers on campuses, in city and state government, and, of course, at the national level. Second, they help guide individual librarians and information managers in their decision making for their own institutions by acquainting them with the broad movements underway that they are more or less participants in. Statistics help by allowing comparisons to be made —hopefully comparisons that include unit costs—between one's library operation and others of similar size and objectives.

While this review will not include an evaluation of efforts to gather statistics on a national level that capture the essential characteristics of the library world—[Williams 1991] and [Schick 1989] are recent starting points for this—a few comments are in order. There are two problems, one general and the other specific. The general problem is the absence of a consistent, effective ongoing data collection method for the purpose of guiding the decision making of our national library system. As Williams asks, "Why does the library and information professional community still not have, after over 150 years of working on the problem, a comprehensive and systematic national statistical data collection system?" p. 465 In the absence of such a program, the kind of inquiry attempted here is severely handicapped.

The specific problem, however, is more to the point. As indicated in [Smith 1993], "Information that is stored, managed , and delivered by computer is becoming a standard and increasing—and increasingly expensive—part of research library programs." p. 390 Just as libraries in former times received their definition and shape from the dictates of the print medium, so too did the various survey instruments and research tools that gathered statistics concerning them. Throughout the history of libraries, for example, the most important measure of a library's quality has been the size of its collection. In an age when information is increasingly electronic and, moreover, is increasingly made available through networks, the size of the library's collection has lost its eminence as a gauge of quality. Access has become the modern equivalent: how much information does a library provide access to for its patrons? Another catch phrase is the delivery of information "just in time," where hitherto libraries were warehouses of materials gathered "just in case." Again from [Smith 1993], "Dollars must be expended to provide the desired information resource, whether article or monograph, on demand, rather than investing in the acquisition of materials for which there is no demonstrated present need." p. 392 One need not subscribe to this bold statement to recognize and acknowledge that the age of electronic information will likely alter the foundations of our national system of libraries. Our problem is to begin to examine what is occurring, preferably through statistics, in order to better understand it, and in order to better prepare ourselves for the new world that is coming.

In what follows, I have first surveyed briefly what is meant by library automation, occasionally interleaving tables and charts that are helpful indicators of what is happening. Occasionally, also, I have interspersed questions that might be included in surveys of libraries to help pin down further the degree to which these trends are influencing current libraries. These are not intended to form a complete set but to be suggestive of the kinds of information that would be helpful and also is not easily available. After this survey, I discuss some categories of concern that are specific to the trends we are looking into. Throughout, the focus is on libraries and library data; neither publishers nor library patrons are considered in any detail.

3. Technology Trends and Their Effects on Libraries

> *I have long believed that any important technological innovation brings about three phases of change. First you mechanize what you did yesterday; second you find that what you do changes; and third you find that, as a result of these changes, the greatest change of all occurs in society. [Diebold 1983, p. xv]*

3.1. The four levels of technology

One can discern at least four stages or levels into which the role of electronic technology in libraries can be analyzed: automation of library processes; access to digitized document surrogates; access to digitized paper based knowledge items; and access to digital multimedia knowledge. Clearly, the first of these is a phase one change in Diebold's terms. The middle two begin to merge into phase two activities where we are changing what we do. Only the fourth, the widespread availability of multimedia knowledge, promises to bring about a phase three change, where society itself is altered.

3.1.1. Automation of library processes

The history of library automation begins with the automation of library processes—in Diebold's terms the mechanization of what we did yesterday. In this respect, libraries are similar to many transaction-based business enterprises. Consider an auto parts store. Such a store has an acquisition function, a collection maintenance function, a catalog. In place of a circulation system, it has a system for recording sales. All such enterprises can benefit from automating internal processing functions, and historically all have heavily invested in data processing software and equipment. In department stores, for example, the checkout counter is often fully automated, with each item carrying a bar-code identifying what it is and what its price is. Each purchase automatically adjusts inventory counts and influences further purchases.

In the library environment, the first process to be automated was circulation because paper based circulation systems are labor intensive, difficult to manage, and expensive. They are also easy to automate and began appearing in libraries in the earliest days. And while bar-code checkout systems are now common, it is not common for library circulation systems to be effectively tied to collection development efforts.

The second application for automation was the creation and maintenance of cataloging information. Automating this process was led by the Library of Congress, with the creation of the MARC format. The purpose of MARC for the Library of Congress was to ease its task of distributing catalog cards for the materials it cataloged. Please note that there is no hint here of "automatic cataloging," a highly desirable but still remote prospect of creating an automated means for doing the cataloging itself. Automatic cataloging goes beyond what can be done through automated data processing and requires techniques based on artificial intelligence. The cataloging process received additional impetus from the creation of the national bibliographic utilities, beginning with OCLC in the late sixties and RLIN and WLN in the early seventies.

Serials management and acquisitions round out the cast of characters for library automation. Versions of each were on the scene in the 1960s but their movement into libraries was relatively slow.

Table 1, derived from [Johnson 1991] gives an interesting insight into this movement. The table depicts the progression of automation through the library functions for 54 libraries belonging to the Association of Research Libraries. See Table: Automation History, page 31.

The table's rightmost column indicates the total number of each process that is currently implemented at all sites (as of the time of the survey—1990). For example, 52 of 54 responding libraries reported that some form of automation exists in their library for the cataloging function. We may only imagine what the remaining two must look like. Surprisingly, only 30 report some degree of automation in serials management. Overall the table gives some feeling for the extent that library processes have been automated in our largest libraries, as well as for the progression that occurred as each successive process became automated.

It would be interesting and valuable if we had such a table for all libraries, arranged by library type, to help us understand the evolution of library automation. Most of the phenomenal growth in library automation has occurred since 1980 as a consequence of two phenomena. First, of course, we had the explosion in the availability of microcomputers and a concomitant reduction in computing costs. This enabled far more libraries to participate in the revolution that was occurring. A second phenomenon was the emergence of the Integrated Library System,—a software design that offered an integrated system of modules for doing each of these services. These began appearing on the market in the early 1980s and are now commonplace.

Here are some interesting statistics: In 1992, the market for library automation packages in the United States was $270 million [Bridge 1993, p. 52]. Total installations in 1992 were 6324 small systems, primarily in school libraries; and 354 large systems. It is not clear how many of these are replacement systems or how many libraries of any size do not yet have automation at all. Of course, the degree of automation at each site is also unclear. To the extent that automation is equated with level of service—a premise that is by no means obvious for many libraries, particularly smaller ones—ignorance of the level of automation in libraries implies ignorance of how well served are library patrons.

A recent survey (May, 1993 in [OCLC 1993]) performed for OCLC of its membership is helpful here. It contained the following table: See Table: Local Systems, page 32.

OCLC members are likely to be advanced over libraries generally—smaller libraries, primarily public or school, but smaller academics as well, are under-represented in OCLC's membership—and within a given library type. Typically, though less so today than ten years ago, an OCLC member, whether academic, public, school or special, relies more heavily on technology than the average. Thus, the results presented in the above table may be slightly biased in favor of libraries that depend on automation. Even so, the results are remarkable and show that a large number of libraries already use, or are about to use, local library systems. When classified by size (*size* here refers to cataloging activity on OCLC, which roughly accords with volumes added) the smallest category of library (less than 2500 titles yearly) either has (44%) or plans to have within a year (28%) a local library system. In all categories, only 11% either do not have or do not plan to have a local library system next year. Although we have no statistics charting this growth, it is clear that the bulk of it has occurred in the last decade.

Automating the Interlibrary loan process

Interlibrary loan, primarily for the purposes of resource sharing, is the last topic I will consider under automation of library processes. It is special in that there is a component within the library and also one that operates across libraries. The major utilities—OCLC, RLIN and WLN—introduced ILL services to their various constituencies in the late 70's and these services have grown rapidly since then.[Saffady 1993]

The recent landmark ARL/RLG Interlibrary Loan Cost Study [Roche 1993], in which 76 libraries participated, puts the importance of ILL in perspective. Key findings indicated that the average cost for a lending transaction was $10.93 and for a borrowing transaction $18.62, with a total cost for the complete transaction of $29.55. Using aggregate ILL counts reported in ARL Statistics 1991-92 [ARL 1993], this translates to $71 million spent by ARL libraries during this period on interlibrary loan operations. Both the estimated unit costs arrived at by the study and the overall sum for ILL will spark much controversy for advocates of resource sharing.

Table 3, from an as yet unpublished OCLC report on ILL trends [Ogden 1993], shows trends by type of library over the last ten years and projected to the year 2000. See Table: ILL Trends, page 33.

This table shows that national spending for ILL could have been as high as $800 million for 1992 and is expected to grow to nearly a billion dollars by the turn of the century.

It is common knowledge that ILL activities are sharply on the rise. Moreover, there is a rising sentiment within the library world for just this trend, as captured in the phrases "access vs. ownership" or "just in time vs. just in case." The ARL study shows just how costly this approach may be. Indeed, it may be argued that other approaches are to be preferred.

An important distinction often overlooked in ILL statistics is between returnables and nonreturnables. The issue is complex, both with respect to the gathering of statistics and in management decision making. Indeed, the case can be made that all statistics in this area should be reported separately, with returnables and nonreturnables never mixed except in aggregate figures for all ILL costs, in a manner similar to the way serials and monograph spending are often separated. There are differences between the two in library process, in interaction with the patron, and in the number of steps involved for each. Finally, the delivery of nonreturnables has an option that is unavailable for returnables: the commercial document provider. The ARL study mentioned above reports that 60% of transactions involved photocopies (nonreturnables), with the remainder being original material. To take a simplistic scenario, suppose these could be supplied directly to a patron for $15 each, instead of the average cost of $30 per borrow/loan reported by ARL libraries in the study. This would represent a potential savings of $21.3 million from the $71 million spent or 30% of the total. That much of the expense is due to staff costs is beside the point: many libraries are being forced to reduce staff.

One last point about ILL statistics. It is often useful to capture the essence of a problem through a single statistic, often a ratio. An attractive option is to represent library activities with respect to the library's patron base. For the ILL function, this would mean recording the number of ILL transactions per library patron. For the state of Indiana, for example, there are .033 ILL transactions per person (5,147,144 population; 170,000 borrowed and loaned) [Statistics of Indiana Libraries 1992, p.51]. For colleges and universities, of course, the ratio would be given with respect to the student population. Some interesting examples of this are presented in Table 4. See Table: ILL Per Student, page 34.

As with many of the statistics discussed here, these have two uses: in the aggregate to indicate national trends; and to enable a specific library to be compared with peer libraries. Notable in the table are the similarities between the two large state universities, Texas and Michigan. ILL volume per student for undergraduate and graduate students are roughly the same. For undergraduate students, both universities begin the period at approximately .2 transactions per student and rise to .4 transactions. Graduate students at Michigan use ILL less, but both institutions evidence remarkable growth particularly in the last three years. By contrast, Johns Hopkins shows considerably more dependence on ILL for graduate students and undergraduates, with very little growth at the undergraduate level and an actual decline for graduate use.

Though it is not clear why these differences exist—more rigorous courses at one of the institutions, a poorer collection requiring ILL as a supplement, or library policies or attitude—it is clear that these statistics reflect an important attribute of the library's environment and their change over time implies serious changes in that environment.

3.1.2. Access to electronic document surrogates

Until recently, the most visible aspect of automation in a library from the patron's perspective was the ability to search and retrieve the electronic versions of catalog cards of the library's holdings. It is worth noting that this powerful patron service became available as a by-product of automating the card production system, and is a manifestation of the point made by Diebold that automation changes what we do. An interesting set of statistics is presented in Table 5, which plots the card production from OCLC with the growth in titles cataloged from OCLC's earliest days (derived from OCLC Annual Reports). See Table: OCLC Cards, page 35.

The rapid growth in titles cataloged through 1984–85 combines growth in OCLC membership, a consequent growth in new titles cataloged, and a period of retrospective conversion of library catalogs; once libraries had completed the retrospective conversion process, the total titles cataloged becomes relatively flat. Card production, as is to be expected when most libraries continued to use card catalogs, initially follows this same path of rapid growth; some time between 1984 and 1986, card production levels off and then begins to drop rapidly as libraries begin to switch to electronic catalogs.

Electronic access to the card catalog can take various forms. Clearly the most attractive is through the library's on-line public access catalog, its OPAC, available as part of its automated system. A less expensive alternative to the OPAC is a CD-ROM version of the catalog. Using this approach, the library purchases a service from a vendor which maintains the library's catalog and periodically creates a current version on CD-ROM. Copies of the CD-ROM are made available at one or more workstations in the library or distributed to patrons for use on their own workstations. A third alternative is through a consortium, which joins an individual library's catalog to the catalog of other, usually similar libraries, forming a union of catalogs. The union catalog is provided to each library through an OPAC or through CD-ROM. OhioLink is one type of consortium, which joins the libraries of academic institutions in the state of Ohio. The Washington Research Library Consortium is a second type and joins the academic institutions in the District of Columbia. A third type is a city's public library system, of which Clevenet is a prime example. The primary purpose of each of these is to effect efficiencies through improved resource sharing and economies of scale.

A second type of document surrogate is a reference to a journal or periodical article. Again viewed historically and following Diebold, the first use made of automation for journal references was to automate the publication of Index Medicus. The by-product was Medlars, a batch retrieval system that was the predecessor to Medline. Today many on-line services provide access to periodical literature references through a large central database; primary vendors are DIALOG, BRS, and OCLC's EPIC Service and FirstSearch Catalog. Alternatives include: mounting databases at a local site, either on the library's computer, or on a college or university's central computer. In either case, the database would be stored on hard disk or CD-ROM, with the latter trading speedy access times for far less cost. A third alternative is the stand-alone CD-ROM station, which has the disadvantage of being restricted to a single user.

3.1.3. Digitized documents

> *Information that is stored, managed, and delivered by computer is becoming a standard and increasing—and increasingly expensive—part of research library programs. [Smith, 1993, p. 390]*

There are two kinds of digitized document and it is important to keep them distinct. The first are documents that arise from desktop publishing, or any other kind of publishing or computer based document creation, that has as its base object some form of ASCII text. These documents may have graphics or images embedded in them, they may be marked up in SGML (Standardized General Markup Language) or other markup language; or be stored in the format of one of the popular word processing programs—Word or WordPerfect; or they may be translated into Adobe's page description language PostScript or its newer Acrobat; or many other forms that documents take in the electronic world. The second kind of digitized document is a page image, usually created through scanning the page using a fax machine or a device designed specifically for that purpose. (Just to complicate matters further, ASCII text files can be and are created from the scanned image using optical character recognition.) It is this latter form, the scanned text, that I wish to speak of first.

Scanning of texts published on paper is currently a very popular activity. UMI has a program for scanning current serials into digital form. Adonis is a document delivery system that operates from a database of scanned articles from the medical field. The Tulip project is an experiment in electronic document delivery that originates in the distribution of scanned images for a core collection of Elsevier journals. Why is this happening? What are they for? When will they ever go away?

As we will see when we discuss the Internet, one of the primary ingredients of the information revolution we are living through is the rapid growth in telecommunications capacity and the rapid decline in their cost. One outcome of the pervasiveness of this technology and its low cost is the expectation that document delivery in scanned image form will become possible on a large scale in the near term. RLIN's Ariel is one manifestation of this—a hardware and software system that expedites the ILL process through the use of scanned images, with delivery occurring over the Internet. And of course the fax machine has become ubiquitous and indispensable for similar reasons. It is unclear what role the scanned image will play in the next decade and that is precisely why it must be carefully observed.

3.1.4. The electronic artifact as primary

> *"But when the primary artifact is itself electronic, the real revolution will begin." [Cummings 1992, pp. xxiv–xxv]*

As the Preamble to this paper suggests, the revolution into the electronic age will be fulfilled when and only when the dominant form of knowledge representation is electronic. The document publication process will be merging tables, graphics, dynamic simulation programs, spreadsheet technology, sound, images and moving images into one multimedia product. It will be interactive, with hypertext links leading users [readers?] to other relevant texts, within the document or in any region of the electronic knowledge world. Ted Nelson's vision of this world is as adequate an introduction to how it will behave as any [Nelson 1990]. Two excellent views from the scientific world: [American Physical Society, 1991], and [Lucier, 1992], are both discussed below.

The best way of charting this evolution is from the side of the producer, much as we keep track of the rapidly growing journal literature or the so–called decline of the book. (So–called because monograph literature continues to grow, though at a declining rate. Bowker is a good source for such statistics.) Indicators are the number and kinds of CD–ROM publications we are getting, some including sound, graphics and video. Such publications will gradually loom more and more largely in acquisitions budgets of our libraries.

3.2. Specific technologies

I would like briefly to discuss three of the ancillary technologies that are moving the library world toward digital information. Each is a separate piece in the overall puzzle. Each plays a prominent role today. And it is not clear how long that role will last.

3.2.1. CD–ROM

> *If the microcomputer workstation dominated the 1980s, CD–ROM technology will dominate the 90s. Paper indexes, major reference works, and collections will quickly shift to CD–ROM. So will about every directory and database of any importance. [Alley 1991, p. 86]*

The CD–ROM is likely to be a transitional technology and similar to microform in the role it will eventually play in the library and information industries. Although it can store immense amounts of ASCII text materials, it is virtually useless for multimedia documents; unlike tape, CD–ROM devices allow direct access but so very slowly that they can support only one user comfortably. Their major use long term is likely to be as an information delivery vehicle.

Would it not be interesting and useful to have accurate statistics on the presence and use in libraries of CD-ROM technology? And would it not be helpful to management to have charts showing the growth of its presence and use, and, presumably, its eventual flattening out and decline? The shift in reference from paper to CD-ROM, which is now underway, implies a vast change that affects professional and educational infrastructures, acquisition patterns, patron training, hardware budgets, etc., etc. In each of these areas responsible managers are working in isolation, trying to divine the scale and timelines of their actions. What are the trade-offs among CD-ROM purchase, use of commercial database vendor, retention of paper copies, site loading of selected databases? Accurate knowledge of what one's colleagues are doing does not provide direct answers, but is a valuable starting point.

3.2.2. Fax machines

The fax machine—ubiquitous, inexpensive, indispensable and an extraordinary surprise for its popularity and rapid growth—is a transitory fad, at least if you subscribe to the prognosticators of the electronic age featured here. Yet the fax machine is itself an integral part of this age. Fax machines are a growing part of the interlibrary loan growth, particularly for such uses as the Ariel device is applied to. Indeed, overheard recently in a library, "I'll Ariel it to you." Why the paradox? There are two problems with the fax machine. First, it is a part of the paper world. Its essential function is to go from paper to digital form and back to paper. As such, it is clearly a makeshift, a transitional device. Second, and even more crucial, as a part of the library work flow for interlibrary loan transactions, it requires a human operator and thus adds to the expense of interlibrary loan. Even so, they are immensely important today and their uses should be studied.

3.2.3. Laser printers

Laser printers will have a longer life than fax machines as an integral part in this revolution. They share with the fax a link to the paper world but they are also an essential contributor to one of the dominant trends in the library world today: access rather than ownership and just-in-time rather than just-in-case. Print-on-demand is likely to become a familiar part of the library world, both for delivering the journal literature, as practiced even today through Adonis and Tulip mentioned above, and in promise with such devices as the Xerox DocuTech Production Publisher, which costs $220,000 and prints 135 two sided 600 dpi pages a minute; it can also collate, saddle stitch, and cover the documents. A production printer like this brings us very close to publication on demand, in the paper world an ideal form of "just-in-time" service.

3.3. Getting there: The Internet

> *With the Internet, networking has "come of age." The information resources that visionaries talked about in the early 80's are not just "research*

> *realities" that a few advanced thinkers can play with in some lab—they're "real life" realities that you can tap into from your home. Once you're connected to the Internet, you have instant access to an almost indescribable wealth of information. [Krol 1992, p. xix]*

Just as the electronic library depends essentially on machine-readable knowledge, the electronic library would be inconceivable without a national telecommunications infrastructure. Much literature has been devoted to the past, present and future of the Internet or the NREN as it will soon be referred to (National Research and Education Network). An excellent introduction is provided by Ed Krol in *The Whole Internet Guide* [Krol 1992]. A recent study by OCLC examined the nature of the information available on the Internet [Dillon 1993]. The most important results are captured in Table 6, "Distribution of Internet Information Types," (See page 36) and in Table 7, "Growth of Information on the Internet" (See page 37).

Table 6 is a snapshot taken in January, 1992, of the kinds of information that is being made available on the Internet. These materials form the core of the "electronic library" now taking shape there. An electronic library, I might add, that is without a selection policy, has no cataloging or reference facilities. Archival practices are primitive. The information is largely free so that access is nearly always equivalent to ownership. The counts given in Table 6 were derived automatically using a program referred to as the "catabot" for "cataloging robot." It is the first, very preliminary step toward clarifying what is "out there." The environment is changing so rapidly that the actual numbers are not so important; it is important to note that straight text amounts to at least 10% of the total, about 40 gigabytes at that time, or the equivalent of 40,000 monographs.

These figures must be interpreted in the context of Table 7, which projects the rate of growth observed over a one-year period to the next decade. If the observed rate continues, the amount of information available over the Internet in the year 2001 will be larger than all previously published information. Now that's something to get excited about!

There are many visions of the role the Internet will play in the coming years in delivering information. Clifford Lynch's *Visions of Electronic Libraries* [Lynch 1991] is a good starting point. Charles McClure details what the stakes are for the public library community in [McClure 1992]. See also Clifford Lynch's review of problems in the Internet environment, *Accessibility and Integrity of Networked Information Collections*, [Lynch 1993], highly pertinent to libraries in their efforts to deal with networked information.

It is clear that the Internet/NREN will influence libraries in a deep and permanent way.

4. Tracking the Impact of Technology Trends on Libraries

4.1. Traditional statistics

> *Valid, reliable, and timely statistics about libraries, collected and disseminated by a respected federal agency, are essential if our nation is to plan effectively for the utilization and development of that vast learning resource. [Lynch 1984, p. 3]*

In part 1 of this paper, I gave a rapid survey of automation in libraries. The questions I proposed are a few among the many bits of data that would be helpful in gaining a more complete picture of what is happening today in the library world in relation to automation. Above, I alluded to the important study, *University Libraries and Scholarly Communication,* as a source for well reasoned commentary on the complex of problems and developments that are under consideration here. Table 8 is from that study [Cummings 1992, p. 47] and makes a valuable point for our purposes. See Table: Library Expenditures, page 38.

This table captures dramatically the changes in library budgets brought about by the computer revolution. As commented on by the study:

The increase in the share of total expenditures to the other operating expenditures category has been dramatic by any reckoning. This share has more than doubled, rising from 6 percent to 14 percent. By all accounts, increasing outlays related to computerization have been the driving force. [p. 48]

What is interesting about the table and the explanatory quote is that we must infer the causes of this dramatic shift in expenditures from library staff to operations. That is, THERE ARE NO STATISTICS to support it! We are in the midst of a dramatic revolution in the library world and our statistical apparatus for describing the structure of libraries has not changed sufficiently to capture even the most fundamental facts concerning it.

What is our statistical apparatus and how well does it function in capturing the impact of automation on libraries? The Bowker Annual is a valuable source of library statistics. In its most recent volume, information from which the following table is derived appears: See Table: Library Acquisition Expenditures, page 39.

The key figures occur in the columns "Digitized materials" and "Database Fees." These show barely 2.33% of public , and 2.99% of academic library expenditures in their acquisition budgets went toward electronic information. If these figures are accurate, they give no sign of a revolution in progress. How rapidly will they change? How rapidly should they change if libraries are adequately delivering information as needed?

In its broadest categories, library expenditures for computers and computer materials are captured by the National Center for Education Statistics in its surveys of libraries. Typical results are given in Table 10, taken from the 1990 survey [Williams 1992]. See Table: Library Operating Expenditures, page 40.

It is useful to know that computer-related expenditures total $209 million in the aggregate categories of "Equipment, computer hardware," Telecommunications," "Online database searches," and "Contract computer services." But we are a long way from understanding what is happening, what parts of the library are being influenced and what services are affected. Nor can we begin to validate the speculation that automation is responsible for the altered proportions of staff to operations expenditures.

4.2. Unit cost measures

> *There are several sources of academic and research library statistics and reports on their compilation. However, few include any cost data that are reliable or useful for budget planning or forecasting. [Cummings 1986, p. 17]*

Among the most valuable kinds of data for libraries are those that illuminate costs. In today's climate of increasing budgetary pressures, analyses that shed light on how management can better use its reduced resources are in demand. Not surprisingly, then, there seems to be increased interest in studies that provide such information. Cited above was the ARL study on interlibrary loan, which is likely to be a landmark in this area and to spark follow-on studies and analyses. An outstanding example of a cost study is Dilys Morris's "Staff Time and Costs for Cataloging." [Morris 1992] What is so unusual about this study is its thorough look at the underlying processes in the technical processing department. For our purposes, it is important to note that the production units included copy cataloging, original cataloging and recataloging (retrospective conversion) for both serials and monographs.

A second study by Marjorie Murfin [Murfin 1993] focuses on unit costs in the reference area. Her purpose was to provide a "fair, reasonable, and practical method for assessing cost effectiveness," as an aid in achieving the "best quality reference service at the least cost." [p.1] In the process, she provides an admirable review of the literature of cost analysis for reference services and presents a reference cost model. The cost data required includes the following variables [p. 11]:

- Annual salaries for all reference department personnel
- Overhead costs for personnel
- Annual reference materials budget
- Annual costs for vendors—OCLC, Dialog, etc.
- Reference transactions per year

It is a combination of such studies across a number of libraries that will lead to useful cost analyses capable of directing library management to better decision making. As Paul Kantor comments, "the value of detailed cost analysis is enormously enhanced when several libraries adopt the same analytic techniques. The results become truly comparable, permitting the determination of representative value and ranges of variation." [Kantor 1986, p. 222] (Quoted in Morris.)

4.3. Transaction analysis

One of the recurring dreams of librarians and system analysts alike is the close interworking of library systems and library management. Automated systems are unparalleled in their ability to capture data reflecting user patterns. There is virtually no question of system use that could not be addressed from data captured from the user's transactions.

Collection development is an obvious area. Why aren't systems designed so that acquisitions modules react to such things as circulation and interlibrary lending? In a consortium, likewise, the stakes for an individual library may be higher due to the proximity of its consortial partners and the ease with which its collection can be used by other than its own patrons. These things deserve tracking and automated ways of achieving system goals. Within resource sharing consortia, for example, load leveling has been suggested as a way of balancing out lending – borrowing patterns to more nearly achieve parity among consortium partners. Within such a system, a library is selected to provide a requested item based not only on availability but also because it happens to be a net borrower and the system is designed to achieve a balance between lending and borrowing across institutions. Such an idea could apply nationally as well. Similarly, statistics on database use can serve to alert a library to databases that should be resident on campus versus made available from a regional consortium or a centralized vendor. In the contest between access and ownership surely the most important input is the usage pattern of journals, with infrequently used, expensive journals as ready candidates for access rather than ownership.

Table 11 demonstrates an idea for collection development. It displays borrowing patterns for a library distributed by subject, in this case by Library of Congress classes. Such a table, aggregated over time, would make a valuable contribution to the collection development staff by pointing out areas where the collection is demonstrated to be weak. See Table: ILL by Subject, page 41.

Melvyl, the University of California's on–line public access catalog, is an excellent model of what is possible in an on–line system. As part of its engineering, it accumulates statistics of system usage of various sorts. Table 12 provides an idea of what is possible with such system engineering. See Table: Melvyl, page 42.

The table displays per student usage of three of the databases made available through Melvyl on five of the campuses. Not surprisingly, use of the union catalog outstrips the use of MEDLINE or Current Contents on all campuses, except at San Francisco, which is unique in California in being devoted to research, education and service in the health sciences, a fact that is evident from the table. Also evident is the relatively low total use per student at Los Angeles.

Automated systems, of course, can generate a wealth of statistics, only some of which would be useful to plot trends, reflect costs or aid in the evaluation of performance. Reference activity such as in Melvyl, could be mapped directly into collection development, within a campus or across campuses. Circulation statistics, interlibrary loan activity, document delivery—all of these shed light on the quality of a collection, or the needs of patrons. From the perspective of how central these systems have become, it is surprising how little we know about the levels of their use or the degree to which they are successful for patrons. In our defense, they are yet so new and their evolution has been so rapid, that we have barely had time to install them, much less to understand how they operate. It would help of course if purchasers of automated systems for libraries could have a reasonable set of expectations for management statistics that could be built into requirements documents for vendors.

4.4. Trends in electronic services

Table 13 was derived from a recent OCLC study [OCLC 1992] which was designed to clarify the kinds and levels of electronic services being offered by libraries. The table captures existing and planned services for library patrons and dramatizes the changes that have occurred in the library world in the last decade. See Table: Electronic Services, page 43.

Virtually every item in this table causes some surprise. That 51% of today's libraries have some capacity for patrons to dial in to their OPAC seems a large number. Likewise, 46% of the libraries in the study can link a patron to the OPAC of another library (how many are over Internet?)

Even more surprising are the plans libraries have to extend services in the next 2 years. Eighty-one percent expect to provide a facility for remote access to their on-line catalog. Though only 21% can order and receive electronic documents directly through document delivery services today, fully 55% expect to offer such a facility in two years.

The same survey disclosed key ambivalences. In a section querying librarian attitudes toward the idea of an "electronic library," 87% agreed strongly or moderately that libraries should strive to become electronic, with patrons accessing library information from remote locations. Similarly, 81% agreed strongly or moderately that they would like to see products that allow patrons to access information on their own. Then, almost in a contradiction, only 6% agreed with the statement that "Suppliers should market their products directly to patrons, rather than to libraries." This group of librarians, at this time, desires information products that patrons can use directly but wishes them to be delivered to their end users through libraries.

To repeat a tiresome refrain: the information presented in Table 13 is helpful for policy makers and library managers. It contributes to the picture of how effectively libraries are accomplishing their mission.

5. Concluding Remarks

> *The information technologies of the late 20th century compel us to rethink the most basic assumptions underlying the processes of research and scholarly communication. [Cummings 1992, p. 107]*

Where are we heading? The view presented by Richard Lucier in describing the UCSF Medical Library [Lucier 1992] is the most far reaching I am aware of. According to Lucier, knowledge management is the next frontier for librarianship. Knowledge management "represents a new model for scientific and scholarly communication in which faculty and research librarians share the responsibility for the collection, structuring, representation, dissemination, and use of knowledge using electronic information technologies." [p. 8] The best example of how this might work is the Human Genome Project, a very large centralized database of unclear architecture which is maintained in a distributed fashion by numerous researchers. The database contains both the raw material of scholarship and the scholarship itself. It is apparently a form of publication and the ingredients of publication under one roof. The role of the librarian, indeed, the role of librarianship, in this endeavor is obscure.

A similar view, though in some ways clearer because it is based on the vocabulary of contemporary publishing, is offered by the American Physical Society's Task Force on Electronic Information Systems (reported in [Schultz 1992]; Schultz is a coauthor of the report of the Task Force). What is proposed is a physics information system that is digital, worldwide, hypertextual; users contribute to as well as read or download from the system. It is an alerting service, a retrieval system, a publishing system. It is not a library.

These two views, in certain respects, provide alternatives to the library model for organizing, storing and delivering documents. They are specific to the electronic world and offered by their authors as major advances over what libraries now provide. They are harbingers of a changed attitude on the part of information consumers who are no longer content with their passive role. They are beginning to design their own electronic libraries; their efforts serve to alert us to the changing environment, to the need to bring our own solutions forward.

How do we want our libraries to function in a world increasingly rich in information and increasingly dominated by information in all its forms? What role will the public library be expected to play in this new age? How will we provision it to perform this role? How can we guide the academic and research library to assume its new responsibilities, assuming they have such, in the age of electronic information? Clifford Lynch, in a lengthy and detailed rumination on *Accessibility and Integrity of Networked Information Collections0* raises many problems and difficulties that arise in this new environment. All the many concerns that were faced and often resolved in the long history of print—intellectual property rights, privacy issues, archiving, edition or version control, and many others—are shown to arise in more virulent and dangerous form in the networked environment. Consider the archiving function of the library, particularly with respect to its collection. As Lynch states, "In the new electronic environment, a bad budget year might well cause the disappearance of much of the existing collection as well as affecting patron access to newly-published information." Such a consequence arises when library materials are leased rather than purchased, as increasingly happens with electronic databases. Do we know what portion of the aggregated library acquisition budget is used for leased rather than purchased materials? How rapidly are funds shifting to leased materials?

The perils of the electronic age are many and rapidly descending on us. Because of the absence of accurate and timely statistics, it is impossible to predict the rate at which these events are happening. It is as though we can feel the distant effects of a hurricane in an age before satellites, weather balloons or planes that can chart the course of such events. Without an accurate appraisal of the storm's direction, speed, strength, or size, we watch in helpless and horrified fascination as it approaches.

This amble through the thickets of our computer age and its influence on libraries does not purport to be thorough. Indeed, it does not even claim objectivity. Rather, it is informed by my own concerns and interests. The topic is a rich one and might take many different perspectives. My perspective is dominated by a sympathy for the difficulties faced by the library as information provider, and by a professional interest in solving the information needs of the library patron. Free access to the world's scholarship has always been a right in western democracies, restricted only by the harsh dictates of practicality. It is a fierce irony of the electronic age that technology places within practical reach the capability of enabling everyone to have at his or her fingertips the world's rich store of knowledge, and yet this dream of the ages may be kept from being realized by our inability to manage our resources, political as well as economic to achieve it.

A national program of statistics that accurately reflects where we are with respect to this dream is a powerful step toward achieving it.

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Table: Automation History

Automation History of Library Operations

Sequence of Automation

Operation	1st	2nd	3rd	4th	After 4th	Total Automated Sites
Cataloging	26	14	8	2	2	52
OPAC	7	16	14	6	8	51
Circulation	15	10	7	7	7	46
Acquisitions	4	7	17	11	4	43
Serials Management	1	4	3	9	13	30

Adapted from Johnson 1991, p. 59

Table 2
Table Local systems

Local System Use by Library Type and Size

		Library Type				Size(cataloging)		
	Total	Academic	Research	Public	Other	Large	Medium	Small
Currently have	65%	67%	89%	58%	59%	0.86	0.56	0.44
Plan to next year	22%	20%	9%	28%	21%	0.09	0.31	0.28
Don't plan to	11%	12%	0%	10%	20%	0.04	0.12	0.26
Total*	98%	99%	98%	96%	100%	0.99	0.99	0.98

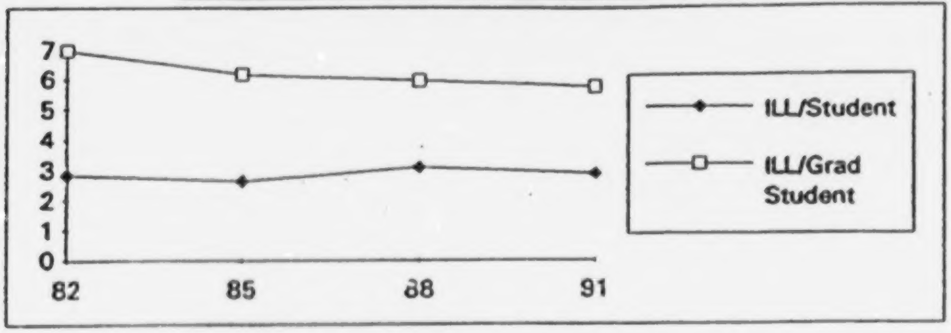
Table ILL Trends

Interlibrary Lending Trends (in millions)

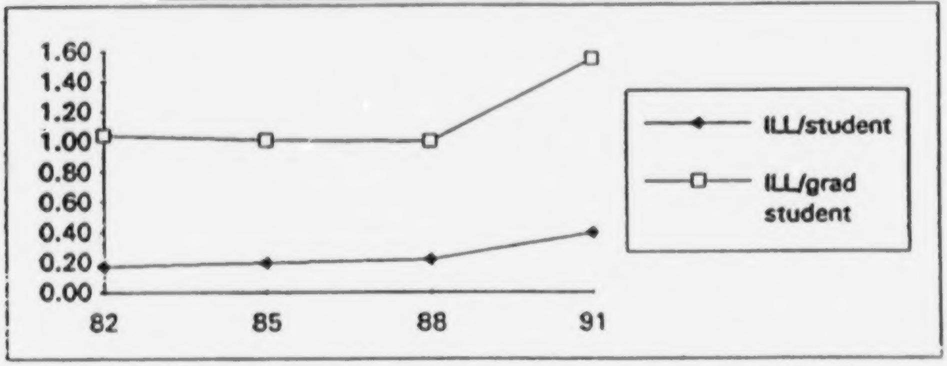
	Public	Academic	Federal	Special	Total
1981	11.74	4.39	1.70	3.11	20.94
1992	13.24	7.12	2.76	3.86	26.98
2000	14.40	10.40	3.90	4.40	33.10

Table ILL per Student

ILL per Student, Johns Hopkins University



ILL per Student, University of Texas



ILL per Student, University of Michigan

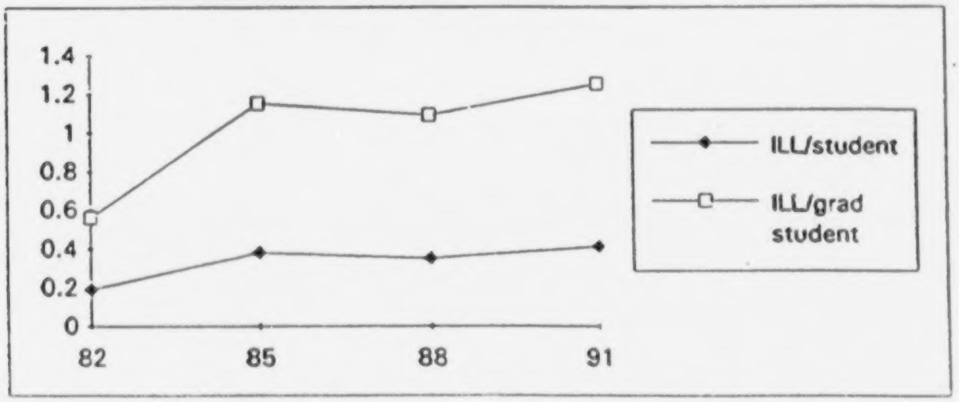


Table 5

OCLC Card Production vs. Titles Cataloged

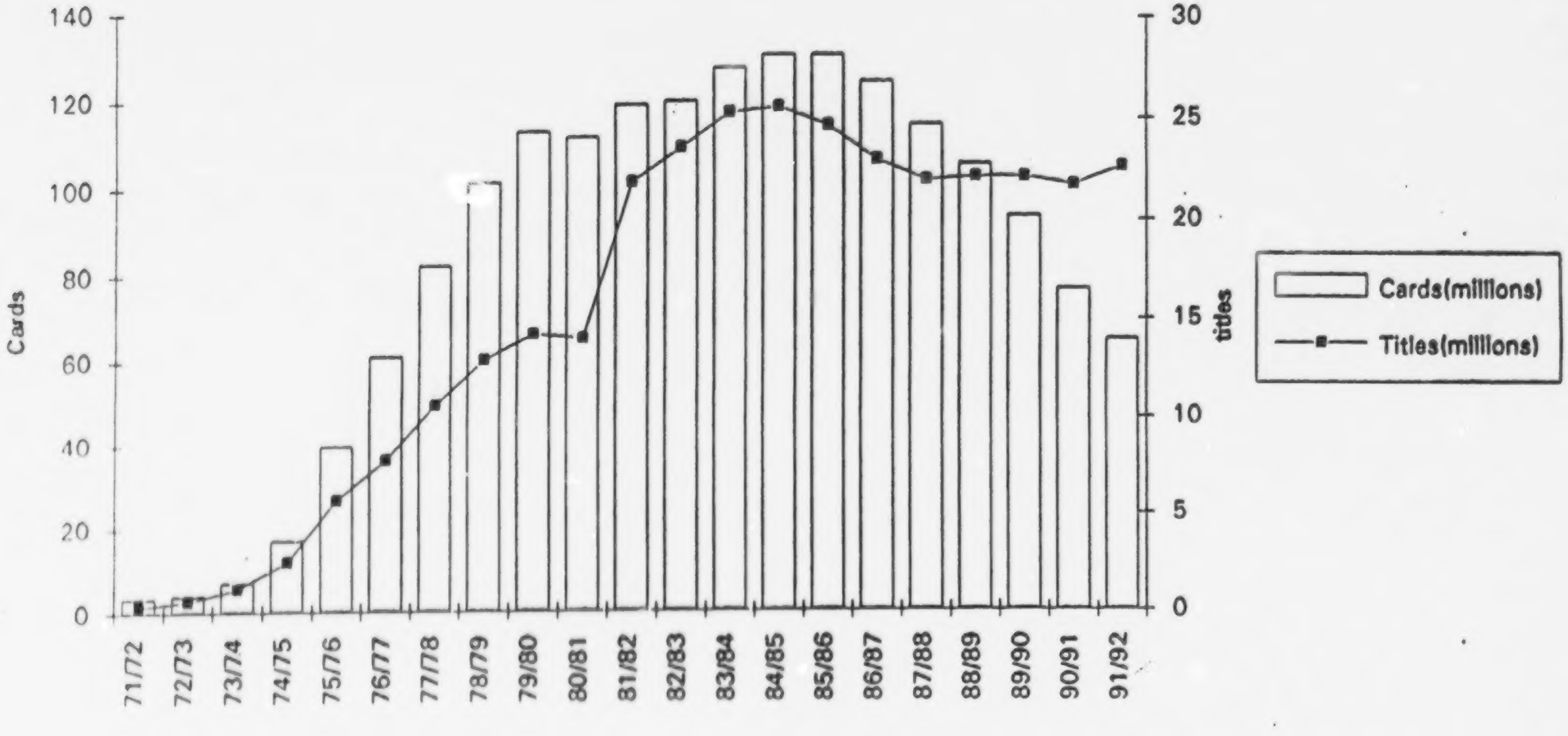
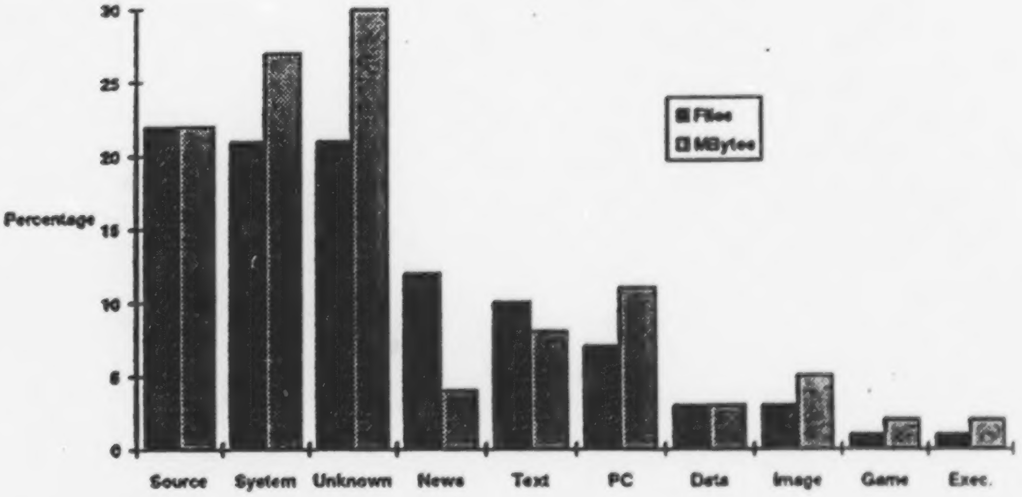


Table 6

Table—Internet Files



Internet Files by Type—1,044 Sites

Table 7 Internet Growth

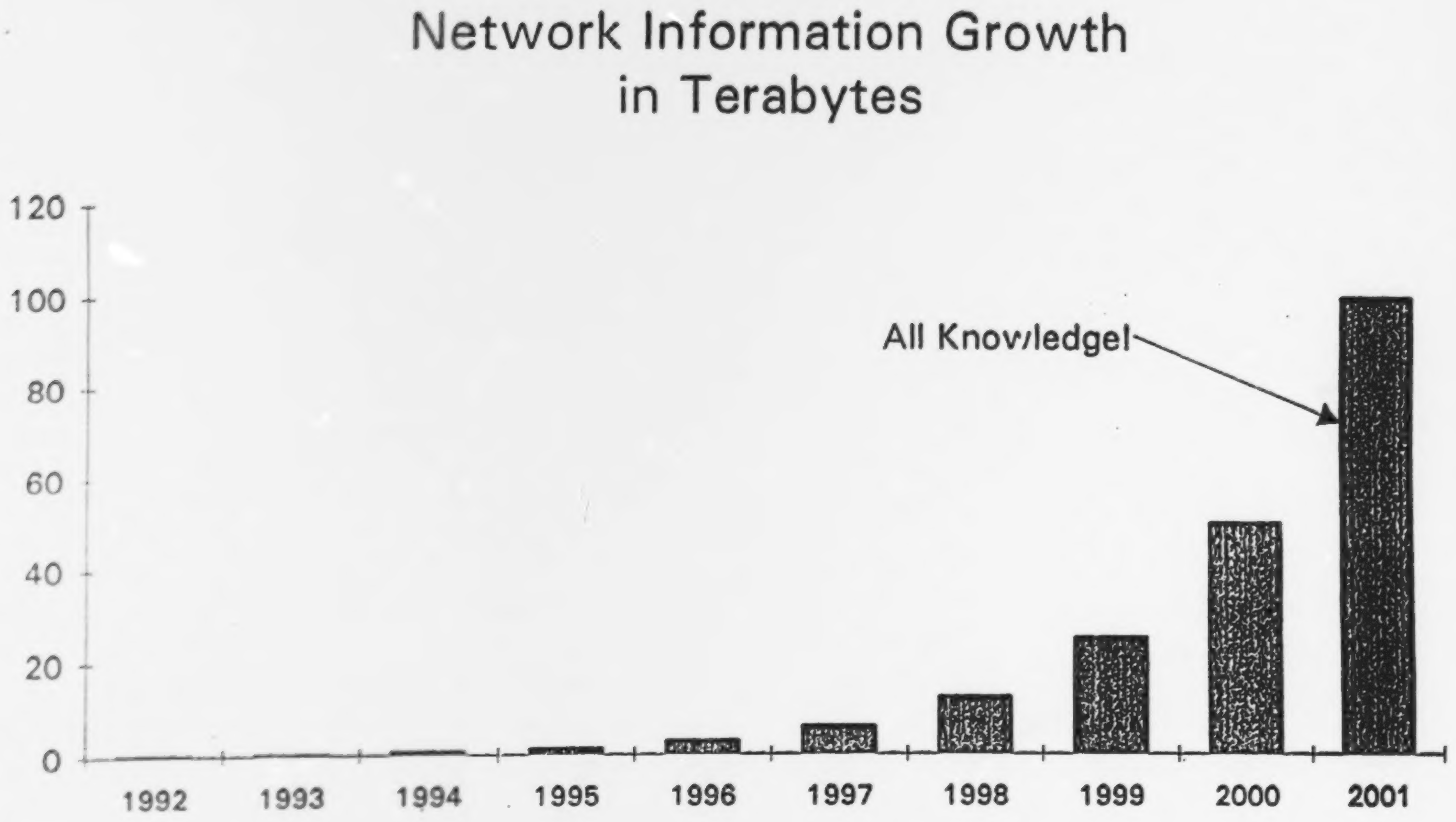


Table 8
Table Library Expenditures

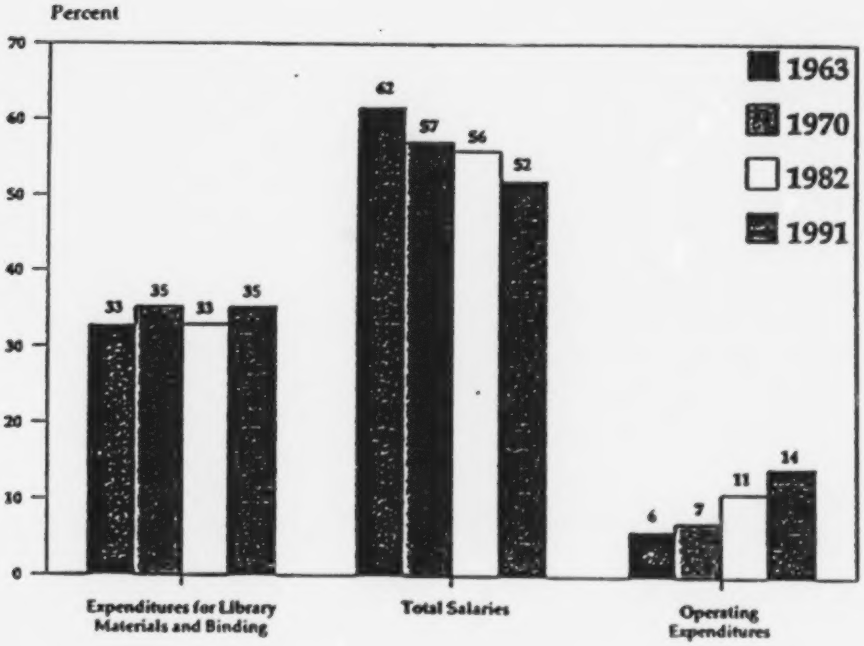


Table 9

Table -- Library Acquisition

Library Acquisition Expenditures, 1991-1992

	Number of Libraries	Books	Other Print	Periodicals	AV Materials	Digitized Materials	Preservation	Database Fees	Other	Total Reported
Public	5894	400.7	5.2	79.7	57.5	4.6	3.7	9.3	34.6	595.3
Academic	2867	323.3	14.8	494.2	50.2	12.8	28.7	16.4	35.7	976.1
Special	2231	30.4	3.3	37	6.7	2.7	2.3	14	13.3	109.7
Government	535	19.6	2.1	16.4	1.8	0.7	4.8	3.8	0.9	50.1

	Number of Libraries	Books	Other Print	Periodicals	AV Materials	Digitized Materials	Preservation	Database Fees	Other	Total Reported
Public	5894	67.31%	0.87%	13.39%	9.66%	0.77%	0.62%	1.56%	5.81%	595.3
Academic	2867	33.12%	1.52%	50.63%	5.14%	1.31%	2.94%	1.68%	3.66%	976.1
Special	2231	27.71%	3.01%	33.73%	6.11%	2.46%	2.10%	12.76%	12.12%	109.7
Government	535	39.12%	4.19%	32.73%	3.59%	1.40%	9.58%	7.58%	1.80%	50.1

From Bowker Annual

Table 10
Table Library Operating Expenditures

Library operating expenditures by object of expenditure, and salaries as a percent of total operating expenditures, by level and control of institution: 1990

Level and Control of Institution	Total number of libraries	Total operating expenditures (000'S)	Salaries and wages (000'S)	Percent of total operating expenditures	Collection expenditures total (000'S)	Equipment, Computer hardware (000'S)	Preservation (000'S)	Postage (000'S)	Telecommuni-cation (000'S)	Online database searches (000'S)	Contract computer services (000'S)	All other operating expenditures (000'S)
ALL HIGHER EDUCATION INSTITUTIONS *	3,274	$3,257,813	$1,693,330	52.0	$1,040,928	$96,235	$37,360	$10,079	$19,047	$16,577	$76,344	$267,912
TOTAL FOUR YEAR AND ABOVE	1,997	$2,866,136	$1,437,479	50.2	$959,687	$79,371	$36,427	$9,567	$17,564	$15,666	$68,745	$241,631
DOCTORATE	488	$1,946,970	$950,967	48.8	$664,434	$52,452	$27,582	$7,178	$14,050	$10,419	$41,735	$178,152
MASTERS	827	$694,567	$368,885	53.1	$223,165	$19,824	$6,809	$1,776	$2,626	$4,251	$19,936	$47,296
BACCALAUREATE	682	$224,599	$117,626	52.4	$72,088	$7,095	$2,035	$613	$888	$997	$7,074	$16,183
LESS THAN FOUR YEAR	1,277	$391,676	$255,851	65.3	$81,242	$16,864	$933	$512	$1,483	$910	$7,599	$26,281
TOTAL PUBLIC	1,504	$2,014,165	$1,080,410	53.6	$639,875	$61,018	$21,498	$6,185	$12,112	$7,932	$44,017	$141,118
TOTAL PRIVATE	1,770	$1,243,648	$612,920	49.3	$401,054	$35,218	$15,863	$3,894	$6,935	$8,644	$32,327	$126,794

* Institutions with accreditation at the higher education level recognized by the Secretary of Education, 1990

Source: 1990 IPEDS Academic Library Survey

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Table 11

Table—ILL by Subject

ILL Borrowing by Subject: University of Maine at Orono, March 1993

LC Subject Area		No. of Items Borrowed
A: General Works		5
B: Philosophy, Psychology, Religion		25
C: Auxiliary Sciences of History		7
D: History: General and Old World		12
E: History: America (General)		16
F: History: United States		1
G: Geography, Anthropology, Recreation		12
H: Social Sciences		53
J: Political Science		2
K: Law		2
L: Education		15
M: Music and Books on Music		4
N: Fine Arts		20
P: Language and Literature		48
Q: Science		30
R: Medicine		41
S: Agriculture		15
T: Technology		21
U: Military Science		5
V: Naval Science		2
Z: Bibliography, Library Science		5
No LC classification Number		1
	Total	342
Breakdown by Type and Bib lvl:		
Language material, printed or microform - Monographic		228
Language material, printed or microform - Serial		113
Projected media - Monograph		1

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Per Student Usage of OnLine Data Bases at Five University of California Campuses in October 1992

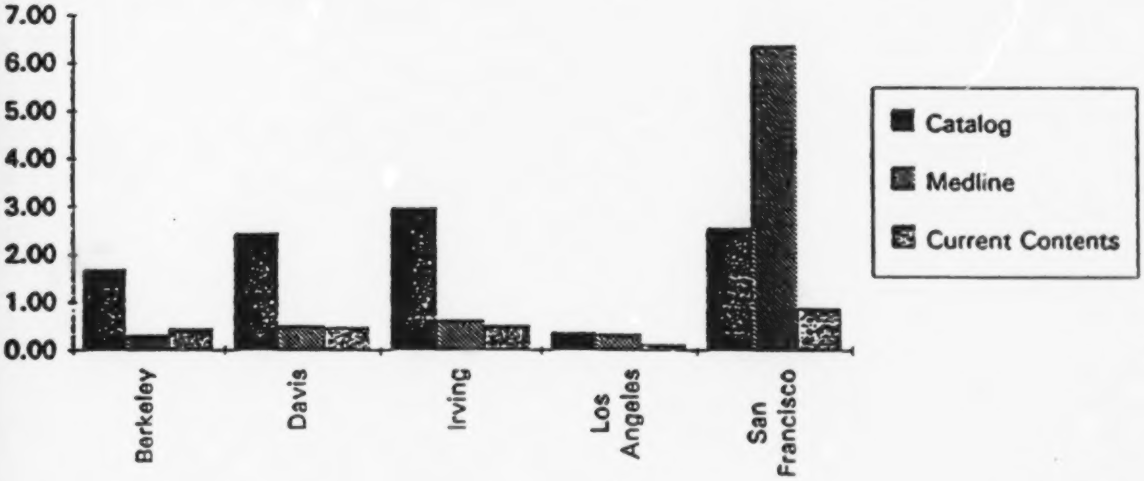

Table Services

Electronic Services in Libraries

Ability for patrons to	Currently offer	Plan to, next two years
Access our library's CD databases from stand-alone microcomputers or terminals in our library	63%	79%
Dial into library's online catalog from outside primary community	51%	81%
Access the online catalogs of other libraries through our library	46%	78%
Access reference databases that are mounted at remote sites	31%	59%
Access reference databases that are mounted onour library's local computer system	23%	55%
Order and receive electronic documents directly through document delivery services	21%	55%
Submit their own ILL requests electronically to our ILL department	18%	50%
Access our library's CD databases from computers linked through library or campus networks	15%	58%
Check out library materials electronically by dialing into our library's online catalog	4%	19%

IV. MULTITYPE LIBRARY COLLABORATION: MEASURES OF IMPLICIT IMPACT

A concept paper
presented for discussion
by participants in
the Library and Information Services Policy Forum

Washington, D.C.

September 23–24, 1993

by

Mary Treacy Birmingham

Today businesses grow through alliances, all kinds of dangerous liaisons and joint ventures, which, by the way, very few people understand. (Peter Drucker)

Thus Drucker captures the spirit and the challenge of the post-capitalist society. Drucker and scores of others argue convincingly for a shift in emphasis from measurements of transactions to an emphasis on relationships among institutions.

The reasons and means for collecting statistics that measure the impact of multitype library collaborations lie both within and beyond the library community. These persistently complex collaborations among libraries abound, refresh and extend the reach of school, public, academic and special libraries.

Writers of the Standards for Cooperative Multitype Library Organizations, adopted in 1990 by the Association of Specialized and Cooperative Library Agencies (ASCLA) note that

> The multitype cooperative has served as a significant change agent in libraries. Specific library services...may be entirely predicated upon cooperative membership. Such cooperative services add new dimensions to the programs of these libraries that would not be possible in an independent setting. Access to information not held locally has come to be the norm, expected by library users in even the most remote rural areas. Interaction of library staffs under the umbrella of a cooperative's programs has also produced significant cross-fertilization of ideas and practices to the benefit of participants and their clients. (ASCLA Standards, p.1)

In the hierarchical structures through which federal funds flow downward and reports flow upward, there has been no deliberate process to assess the impact of multitype systems. Still, library users and taxpayers alike are served by these systems which operate through and around more traditional bureaucracies.

With a little imagination and a nod to the information environment, is possible to track and measure the impact of multitype collaboratives -- to the benefit of the systems, the libraries for and through which they function, and the public that is served by those libraries.

Some reasons to look at multitypes:

There are countless reasons to avoid the quagmire of statistical analysis of multitype library networks. There are far more compelling reasons to embrace the challenge.

o Library collaborations have now been on the scene long enough so that models have emerged. Ideas have been tested; structures, funding, procedures, services and relationships are fluid but identifiable and thus measurable.

o Collaborative systems have become an essential factor in the library service equation; failure to measure the impact is to underrepresent the impact of federal funding on the delivery of services provided to the public by and through participating school, public, academic, and special libraries.

o Collaborative systems offer indirect cost savings and expanded impact to participating libraries.

o More important, multitype systems offer a powerful mechanism through which libraries of all types leverage federal, state and local funds. Again, to not measure that leveraging process is to undervalue the services rendered the public and the contributions to services by libraries working collaboratively.

o The community of libraries that comprise multitype systems can be a model for communities of users that libraries themselves might create. What is learned in statistical analysis of multitypes may in turn inform the evaluation process for school, public, academic and special libraries.

o Local sharing patterns are complex, sometimes elusive, difficult to capture through existing measures based on traditional transactions. These relationships that support collaboration are real and increasingly essential to the ready flow of information. Multitype systems offer a window on the nature and degree of local sharing not only of print materials but of facilities, expertise, reference services, delivery systems, etc.

o Much of the experimentation that takes place within libraries is by and through collaborative systems -- experimentation with technologies, information flows, training, new patterns of service delivery and user education.

o Multitypes are also a source of continuing education through both traditional means (workshops, etc.) and through informal learning including job exchanges, peer instruction, mentoring.

o Likewise, collaborative library systems are engaged in essential planning activities, not only for their own internal purposes but for regions and aggregates of libraries.

The process can shed light on the impact of multitype library cooperation as a significant aspect of library service. Further, such a study can illuminate the total impact of the knowledge and relationships that inform the work of librarians and libraries. The challenge is to identify, respect and reflect the infrastructure of relationships that inform, create value and undergird library services today.

The means:

Any look at multitype systems must relate to the major statistical work that is already well underway in libraries. Efforts including those of the National Center for Education Statistics and the National Commission on Libraries and Information Science offer insights into factors and features that can be identified and reported by multitype systems. The greater challenge is to expand on what exists in order to appropriately reflect a very different reality in multitype systems that work with and through libraries. While these systems do not serve the public directly, the work that happens within multitypes has a profound, often implicit, impact on the total delivery of library and information systems.

Hence, multitype systems need to be viewed from the perspectives other than that of direct service. A major purpose of this paper is to suggest measures of the impact and outcomes of multitype collaborations; these same measures may be adaptable to and useful in the analysis of the variety of library systems whose service to the public is indirect but essential. For purposes of discussion this paper will possible measures of impact of multitype collaboration from the following possible perspectives:

o **Traditional data collection techniques:** Identification of data elements which are parallel to and congruent with data collected from public, academic, special, and school libraries. Expansion of the data to include information unique to multitype systems is an obvious first step.

o **The value constellation:** Information systems in general, multitype library collaboratives, in particular, resist any effort to fit in a neat niche on the information chain. Assessment of the impact of multitype systems demands a fresh look at and appreciation for the complex context that both serve and reflect.

o **Co-production of services:** Multitypes exist specifically for the purpose of achieving collaboration among libraries. An appropriate measure of service is to identify the elements of co-production as they are reflected in the structure and the practices of the organization.

o **Capacity building:** Similarly, multitypes are effective insofar as they build the capacity of their members to serve the public. A multitype organization serves best when it enables rather than provides. The challenge is to measure that enabling process.

o **Sustainability and the learning organization:** Key to the notion of capacity building is an emphasis on sharing and support of the human resources of libraries. Much of the energy and resources of the multitype organization is committed to creating systems that are not dependent on the multitype itself.

o **Planning/community impact:** The common purpose of the multitype system derives not from the members but from the community of users to be served by multiple related organizations. Thus, responsiveness, flexibility, ability to listen to and have an impact on the community are key factors in the analysis of multitypes.

Definitions:

One of the strengths of library collaboratives is their diversity. Over the past twenty years a number of factors have led to the development of varied and complex models. The systems are multiple and single purpose, based on geographic and type-of-library molds, funded by membership, state and federal funds, contracts and fees for service. Some are governed by the members, others by publicly appointed or elected boards. The amount and type of administrative support varies extensively. Membership may be as exclusive as the Research Libraries Group or as ecumenical as the many local/regional multitypes that include the elementary schools, special collections, and private corporations.

While it is virtually impossible to conceive a taxonomy of library collaboration, it is useful, perhaps, to reflect on some generally accepted terminology. Arthur Himmelman, a guru of collaborative strategies, offers some generic definitions to reflect the level and kinds of inter-organizational involvement:

> o ***NETWORKING*** is the most informal, requiring only sharing information for mutual benefit
>
> o ***COORDINATION*** includes a willingness to exchange information and alter activities for mutual benefit and to achieve a common purpose
>
> o ***COOPERATION*** involves greater commitments, including exchanging information, altering activities, and sharing resources for mutual benefit and to achieve a common purpose
>
> o ***COLLABORATION*** includes exchanging information, altering activities, sharing resources, and enhancing the capacity of another for mutual benefit and to achieve a common purpose. (Himmelman, p.9)

In terms of original mission and membership, even more in terms of historic development, multitype library collaboratives fall towards the latter end of the continuum.

Standards for multitype collaborative systems:

The comprehensive study of standards for multitype library cooperative arrangements conducted by ASCLA identified the following common features to be addressed in the design and operations of multitype systems: Governance; Service Programs; Financial Support; Accountability; Roles and Responsibilities (doing things right vs. doing the right thing.) The ASCLA standards are sufficiently inclusive to apply to any multitype library collaboration; they are at the same time sufficiently specific to be of use. These broad categories, captured in the ASCLA standards, form an appropriate basis for a statistical analysis of multitypes.

The ASCLA standards are also consistent with the wealth of literature that abounds in the growing recognition of the structure and impact of collaborative efforts. The argument has been made that libraries themselves should be judged by the communities they create and that librarians manage not information but relationships. The collaborative model is at the core of any serious effort to study multitypes for which the underlying challenge is to improve service through the creation of communities of libraries.

In assessing issues and trends it is useful to measure the ASCLA standards against accepted models of collaboration. The following chart offers a general overview of the parallels that exist and that underscore the inherent strength of the ASCLA standards:

Convergence of ASCLA Standards with accepted models for collaborative systems:

Column 1 reflects the ASCLA standards;
Column 2 reflects a construct developed by Arthur Himmelman
Column 3 reflects a summary of the concept of collaboration based on the experience of partners in the urban literacy arena.

ASCLA Standard	*Himmelman*	*Urban Literacy*
Governance	Governance	Governance
The Multitype Library Organization shall have a formal governance structure that provides for representation of all types of libraries that are members of the organization. The Multitype Library Organization shall be established through statutory or enabling legislation, state rules and regulations or by formal written agreement. The Multitype Library Organization shall maintain documents which are approved by the members and which prescribe the governance structure and purpose.	Community priorities are reflected by the purpose of the collaborative. Community-based organizations select representatives who negotiate a collaborative with strategically identified public, private, and nonprofit organizations outside the community. Negotiations with outside agencies and institutions produce agreement to proceed on a collaborative basis under the purpose established by the community, and within a governance and administrative process in which power is equally shared by the community and outside organizations. The governance and administrative structure includes a policy board, an executive committee, action groups for implementing plans, and staff agreeable to the community to assist the collaborative.	A structure that permits diverse groups to speak and act with one voice while retaining their distinct and sometimes opposing goals and positions on other matters; A clear structure and operational guidelines (bylaws, agreements, etc.) to guide ongoing activities; Specific functions and action plans that are coherent, concrete and actionable; Involvement, support, and endorsement of high level government officials and other community leaders; A 'culture' or set of norms characterized by respect, honesty, mutual benefit, compromise , and equal status of all; manipulation, deceit and misrepresentation are actively rejected by all members. Diverse groups with a core of common interests that come together to advance particular interests;
Service Program	Service Program	
Based on the needs of the members, the Multitype Library Organization shall be responsible for developing a Service Program. The Service Program shall be developed based on the Mission Statement and goals and objectives of the Multitype Library Organization Based on the Service Program the Multitype Library Organization shall develop strategies for implementation. The Multitype Library Organization shall have staff to effectively administer and facilitate the Service Program. The Multitype Library Organization shall have adequate facilities, equipment and operational support for the provision of Service Programs.	Goals are implemented through action plans fully supported by community residents as well as by representatives from the public, private, and nonprofit institutions from outside the community. The process is initiated in a community setting and assisted by community organizing; early discussions focus on assumptions and values. Community problem identification includes both data-based trend analysis and narrative examples from community residents.	
Financial Support		Financial Support
The Multitype Library Organization shall have ongoing Financial Support. The Multitype Library Organization shall have a written budget approved by the Board. The Multitype Library Organization shall maintain internal accounting procedures in accordance with generally accepted accounting principles.#1		The absence of competition for funds, attention, prominence, etc. between the coalition and its members or constituents; A focus on overall resource development that extends beyond raising funds to developing a broad and enduring foundation of investment and commitment;
Accountability	Accountability	Accountability
The Multitype Library Organization shall maintain a systematic and continuous process for evaluating its Service Program. The Multitype Library Organization shall report at least annually to its membership and funding authority its progress towards attaining the goals of the organization.	Commitments to assessment and evaluation in public settings provide community-based organizations with opportunities for monitoring the process of the collaborative.	Extensive communication with membership around activities, successes, needs, activities of members, and what's going on in other communities.
Roles and Responsibilities	Roles and Responsibilities	Roles and Responsibilities
All parties involved in the Multitype Library Organization are mutually responsible for the development and implementation of the organization's overall Service Program and success of the organization. The Governing Authority has the responsibility to hire and evaluate the Chief Executive Officer and to approve policy and budget. The Chief Executive Officer has the responsibility to implement Board policy and the Service Program. The members have the responsibility to honor membership and Service Program commitments.	Substantial attention is given to the balancing of administration/ management goals and community participation goals. (Adapted from Communities Working Collaboratively for a Change by Arthur Turovh Himmelman, September 1991.)	Leadership that is geared toward being inclusive rather than exclusive, facilitating and enabling rather than controlling, and that models and enforces key norms in a way that helps others learn; Specific functions and action plans that are coherent, concrete and actionable; A focus on overall resource development that extends beyond raising funds to developing a broad and enduring foundation of investment and commitment. (Adapted from Cooperative Efforts in Urban Literacy Learning from the Urban Literacy Networks Grant Projects, M. Williams, October 1988.)

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Application of traditional data collection techniques:

A great deal of the information about multitype collaborative arrangements is straightforward and readily available. Data elements that can be collected with relative ease are included in the following chart of data elements:

Data Elements Relating to the Basics of Multitype Library Organizations

A. Structure: ***These elements are essentially parallel to the data elements included in the carefully wrought NCES statistics for public libraries.***

Identification	Name/address/phone/fax/Internet, etc.
Membership	Numbers of members
	Numbers of library outlets represented by the membership
	Types of libraries that are members
	Numbers of staff employed at member libraries
Administration	Size and level of staff (income)
	General definition of staff responsibilities
	Housed separately or as part of another agency
	Accountability of staff -- to board, membership, etc.
Geographic area served	Local, Regional, State, National, International
Statutory/enabling authority	Local/regional recognition of mutual need
	Expansion of existing system, e.g. public library to multitype
	State legislated
	Regionally legislated
	Does the organization have a constitution and/or by-laws
Governance structure	Public appointed/elected board
	Governed by representatives of the membership
	Direct governance by membership
	Subsidiary of other entity, e.g. university of public library system
Terms of membership	Written agreement
	Membership fees
	Mandated
Documentation of structure	Mission statement
	Goals and objectives
	Annual plan
	Long range plan
	Statements of responsibilities of membership

B. Service Programs : ***While the programs of library collaboratives are wonderfully diverse, there is ample opportunity to reflect the services in meaningful ways over a broad spectrum. Possibilities include the following:***

Program initiation and design	Developed by staff, membership, or representatives of the membership
	Mandated by the state or other authorizing agency
	Determined by availability of funds -- e.g. fees for services, grants
Facilitation	Quality of data, information, research and other forms of communication provided
	Quantity and quality of internal and external resources identified and provided by participants
	Degree to which traditionally underrepresented organizations and individuals play a significant role
	Timeliness and quality of oral presentations and written communications
Program implementation	Responsibility of staff, volunteer members, contractors, consultants
	Cost effectiveness of program improvements
	Degree to which members are included in decisions about program improvements, monitoring and evaluation
Products and results	Quantity and quality of improved library service (reference, interlibrary loan, public programs)
	Degree to which libraries are considered community resources
Program evaluation	Mandated reports to the state
	Mandated reports to the federal government
	Reports to the membership - numbers of reports disseminated
	Reports to the public - numbers of reports disseminated
Quality of collaborative participation	Diversity of participation from different types of libraries
	Level of decision-making authority within their "home" organization
	Quantity and quality of resources contributed by members (financial, human, technical, recorded)
	Effectiveness of communication among members
	Quantity and quality of knowledge and skills shared among members

C. Facilities:	Office space, Equipment (major), Phone lines

D. Staff:	Professional staff
	Support staff
	Consultants
	Volunteers

E. Financial information :

Income	Federal funds
	State funds
	Membership dues
	Fees for services
	Grants
	Contracts for services
	Sale of products
Expenditures	Salaries
	Benefits
	Flow through funds
	Capital expenditures
	Etc. to whatever detail seems meaningful

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Still, an understanding of the role and impact of multitype library collaborations goes far beyond this elemental approach. The real question is whether all of the descriptive information about structure and services makes a difference to the member libraries and to the publics they serve. While the data collection and analysis may be complex, it is worth exploring the possibilities.

Some basic concepts underlie the analysis of the complexities of collaborative systems and their impact:

Multitypes and the value constellation:

The first challenge is that the impact of the activities conducted by and through collaborative systems is neither immediate nor direct. **The carefully honed statistical measures that apply to public, academic, school, and special libraries cannot simply be tweaked to fit the collaborative structures.** In this the library community reflects, and in some ways anticipates, the challenges of complex institutions in both the public and private sectors.

Historically, institutions fit neatly along a value chain. Normann and Ramirez note that

> Our traditional thinking about value is grounded in the assumptions and the models of an industrial economy. According to this view, every company occupies a position on a value chain. Upstream, suppliers provide inputs. The company then adds value to these inputs, before passing them downstream to the next actor in the chain, the customer [whether another business or the final consumer]. Seen from this perspective, strategy is primarily the art of positioning a company in the right place on the value chain.

Thus, measures of services, including libraries, tend to place the institution in a specific position as the direct link between a resource and a user. The writers point out in a general way the limitations of the construct. Recognizing those limits opens the doors to more creative assessment of the impact of multitypes and of libraries. Indeed, the traditional mold ill fits and inadequately describes the richness of library collaborations -- and of libraries. The difficulties of any traditional statistical analysis applied to library collaboratives are manifold:

o The systems themselves are overlapping. Institutions belong to multiple collaborative systems, each serving a unique and distinct purpose for the library's users.

o Networks are "implicit," built on and designed to reinforce human connections as well as library-to-library interactions.

o Transactions are not discreet actions but layers and groupings and ad hoc maneuverings within and among institutions.

o Multitypes are particularly difficult because of the very different roles that libraries play in different institutional settings; e.g. the functions of the school librarian reflect the mission of the school, while those of the corporate librarian reflect a very different context.

The possibility of repositioning the systems on the value chain offers real possibilities for a fresh look at the systems themselves and at libraries.

Co-production of services:

At the very base, changing access options for the user are transforming the traditional relationships between users and information and thus among libraries themselves. An intriguing concept is that of co-production of value and the role that multitype collaboratives play in the co-production of library and information services for an identified customer base.

In thinking about multitypes as models of co-production of services it is useful to return to the observations of Normann and Ramirez. Though it is admittedly risky to borrow without question from the corporate model, there are lessons. Normann and Ramirez point out that

> the traditional understanding of value is as outmoded as the old assembly line that it resembles, and so is the view of strategy that goes with it. Global competition, changing markets and new technologies are opening up qualitatively new ways of creating value....Strategy is no longer a matter of positioning a fixed set of activities along a value chain. Increasingly, successful companies do not just *add* value, they *reinvent* it. Their focus of strategic analysis is not the company or even the industry but the value-creating system itself.

This "big picture" is an appropriate backdrop for the discussion of the role of multitype library systems. In fact, **multitype systems do not just add value, they reinvent it** -- by bringing the recorded and human resources of multiple libraries to bear on the delivery of service to a common population or for a common purpose. As in the corporate model, **the focus is on the value-creating system itself. This approach suggests that multitype systems need to be assessed not just in terms of the output of their member libraries but in terms of the value-creating process as separate and real**. Such an approach marks a real departure from traditional measures of quantity, facilities and outputs from specific library systems or outlets.

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Many multitype systems began as efforts to co-produce specific products and services, most often bibliographic utilities or union catalogs. The model is extended now into unanticipated programs, services, and impact. This concept of co-production serves well as a measurement model consonant with the information age. As Normann and Ramirez suggest, **members do not so much consume value but create it. The goal of the system is to mobilize the membership in new ways, in many cases to produce services that are different in design and nature than those that could be produced by any one type of library or individual institution working alone.** The statistics must reflect this concept of coproduction, moving from the assessment of who consumes and who gives, to capturing the ways in which, through the system, the institutions work together to invent new services, products, and relationships.

Some possible strategies:

o One measure of this concept of co-production is the amount of time spent learning about and using the network. Measures would include time spent in workshops about the collaborative, in task forces, planning sessions, and other mutual activities devoted to improving library services through collaboration.

o Another key measure of co-production can be expressed in terms of extensiveness -- how much of the service has been provided -- e.g. numbers of users;

o Efficiency is a solid measure -- savings of time, money, or duplication;

o Measurement of effort sheds light on the use of resources -- e.g. cost per session in providing access to users of online catalogs average time required to use a remote database or training to both deliverers and receivers.

Though it is problematic to categorize the service areas in which multitypes participate, a general rule does apply: All of the services are co-produced.

Following is an adaptation of a list of co-produced services based on a sample list contained in the ASCLA study:

Sample services undertaken by Multitype Library Organizations.

The following list is based on a list contained in the 1990 ASCLA Standards.
While no list of multitype services can be definitive, the sample suggests the range of possibilities:

Access/Referral Non Libraries
Access to Local/State Government Information
Building and Space Planning
Common Standards
Consulting
Continuing Education
Contracting for Services
Contractual Program Administration
Cooperative Acquisitions
Cooperative Collection Development
Cooperative Programming
Cooperative Storage
Data Base Searching -- Free or fee
Data Management
Delivery/Courier System
Deposit Collections
Electronic Bulletin Board
Electronic Mail
Expert Testimony
Facilitating
Film Cooperatives

Grant Writing
Graphics
Group Purchasing
Hiring Assistance
Information Clearinghouse
Interlibrary Loan -- free or fee
Legal Awareness
Lobbying
Marketing
Materials Examination Center
Materials Review
Meeting/Conference Planning
Negotiating
Newsletter
Permanent Loan of Materials/Equipment
Policy Development
Preservation Facilities
Printing
Production Facilities
Professional Awareness
Professional Collection

Program Evaluation
Public Information
Publications
Reciprocal Access
Reciprocal Borrowing
Reference Center
Representation of Libraries in Communities
Research and Development
Retrospective Conversion
Rotating Collections
Serials Cancellations
Shared Licensing
Shared Personnel
Shared System
Software Development
Technical Services
Telefacsimile Communications
Temporary Loan of Materials/Equipment
Union Catalog -- % of members' holdings
Union List of Management
Union List of Serials

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These activities are meaningful to the extent that they reflect the value that is created by the process of co-production. Though the end product is the service, the ***measure of the system*** is the impact of the multitype collaboration that facilitated the relationship itself. What is to be measured is the reinvention of the service.

Capacity building:

An equally important function of library collaboratives is to enhance the self-sufficiency of the members. This concept of self-sufficiency may at times be at odds with the prevailing notions of library cooperation; tradition favors the model of dependence. Larger/richer libraries magnanimously share the wealth -- wealth purchased with the same public dollar that supports smaller institutions. What is missing from the traditional sharing equation is the contribution of the local library that connects the resource with the user and the unique resources of the smallest library. **A fundamental premise of multitype library cooperation is respect based on the simple notion that each library is an essential player in the constellation of information providers.**

Key to the interdependence of the system is the self-dependence of strong members. Toward this end, the energy of the system is directed to increasing the capacity of members to deliver the services directly to their own clientele, to assess users' needs and to feed that information into the system itself.

Again, a paradigm shift is necessary to make the transition from counting, and thus rewarding, transactions to assessing the impact of an environment in which *fewer* transactions may be the measure of achievement. Capacity building can be measured in terms of how well the collaborative service meets the objectives of the provider or of the user. A major indicator of effectiveness is the degree to which the needs are both identified and addressed at the grassroots level.

Sustainability and the learning organization:

Closely related is the concept of sustainability. Multitype systems are geared to systemic improvement; sustainability is essential. The system and participating members cannot be subject to whims or jolts or dips. **Decisions about allocation of resources rest on the degree to which the system, as an organic whole, can sustain the operation or service.**

Another way to express this is that the library collaborative is a learning organization. One simplistic measure of this learning environment can be expressed in terms of actual number of hours and type of support received by participants. Other possibilities include, but certainly are not limited to, the following:

- Training programs
- Systematic problem solving
- Experimentation
- Demonstration projects
- Learning from past experience
- Learning from others
- Research and development
- Communication
    - Newsletters
    - Electronic bulletin board
    - Online conferences
    - Fax networks
    - Hotline
    - Internet participation
    - Use of communications media, e.g. cable
- Distribution of materials among members
- Preparation and distribution of guides to resources, etc.
- Consulting support -- technical advice and problem solving
- Clearinghouse activities -- responses to queries, mediating functions

Planning/Community impact

Measurement of library collaboratives, as the measurement of library service itself, is outcomes based. Again, the challenge is complex, though it is based on the simple fact that the **participants in the organization are working together to serve a common community of users. The challenge is to agree on the desired outcomes.**

On the one hand, those outcomes are internal: The system must measure the impact of the services made possible through the collaborative itself, to identify how a service made a difference in some other activity or situation, how use of the network increased the effectiveness or efficiency by which librarians provided services to their immediate customers.

Externally, the goal is to assess the degree to which the libraries, working through the collaborative, identify and address community/institutional goals. Here the organization can be assessed in terms of the degree to which it has its institutional ear to the ground of the community it serves.

Most of the process of outcomes-based measurement is of necessity specific to the collaborative itself. Statistical analysis is impractical and irrelevant. Still, since the essence of outcomes-based evaluation is agreement on the outcomes themselves, one valid measure is the degree to which members are involved in the process of planning, goals setting, program design. It is possible to measure membership participation in such internal activities as the following:

- selection of representatives
- goal setting
- identification of criteria
- participation in the planning process
- participation in design of programs
- involvement in evaluation

Responsiveness and resilience:

It is also possible to identify the degree to which the systems have in place structures to respond quickly to emerging needs, to capitalize on opportunities, to seize on the possibilities presented by the unintended results of collaborative efforts. Participation in the learning mechanisms of the organization can create the dynamic synergy that typifies a healthy collaborative. There are also possibilities for measuring the degree to which the members of the library collaborative address community (geographic or community of interest) needs. Measures include the following:

- Systems for external scanning or issues identification for the community of libraries or for the community served by the collaboration of libraries

- Reports to membership, to the community, to administrations of participating organizations (e.g. Superintendents of Schools, College Presidents)

- Surveys

One possibility for getting a handle on this aspect of multitype collaboration is to specify issues that indicate responsiveness. An example might be a query related to the degree to which a system has incorporated relevant information and staff training on a current topic (response to passage of federal legislation extending services to persons with disabilities, attention to libraries' collaborative approach to meeting the needs of targeted populations, e.g. migrants, the elderly, pre–schoolers and youth, or programs that promote information literacy and critical thinking skills).

Measures of multitype collaboratives must be open–ended and responsive in themselves, capable of detecting unintended results -- surprises that are the inevitable consequence of collaborative efforts. Any analysis of multitype systems must recognize entrepreneurship, creative problem–solving, rewards for risk-taking and lessons learned.

Alternative sources of data

The impact of multitype library cooperation can be faintly detected through careful analysis of data originally collected for other purposes, particularly statistical studies of school, public, academic, and special libraries. At best, these studies indicate if the individual library belongs to any consortium. Collecting this information is an obvious first start.

More helpful would be inclusion of appropriate queries about multitype impact and services within those studies. It would be useful to measure the degree to which the responding institutions contribute to, receive services from, and incur savings or costs through their participation in the collaborative organization.

At the community level, it is also possible to include information about library collaboration in ongoing community–based studies. Such studies can produce information about the community that is useful to the systems and information about systems, information flow and user needs that is useful to the community. One function that multitypes can serve is to ensure that library issues are represented in general surveys of the community served.

It is also possible to extrapolate some information from existing studies of libraries and information services. There are clues within reports that are routinely published. These include information on such things as the following:

- ratio of interlibrary loan to in–house borrowing
- numbers of items borrowed
- availability of public access terminals and their degree of accessibility
- access to jointly stored collections
- availability and use of document delivery services
- distribution of information produced by multitype systems

Possibilities include studies by type of library (public libraries, school libraries and media services, law libraries, special libraries, academic libraries) and by specific service (e.g. services for children and youth). There is also information about collaboratives that can be read "between the lines" of several public opinion polls on libraries and information services, e.g. the recent Gallup poll study conducted by George D'Elia.

Supply and demand for professional librarians

The challenge of preparing professional librarians for this multitype environment is both general and specific. While there is no single curriculum that can meet the needs of every system, there are some clear directions which professional education can take to prepare students for management of collaborative systems.

The task of the multitype is to manage multiple relationships which the system fosters rather than controls. Peter F. Drucker precisely describes the work of the multitype executive:

> **You have to learn to manage situations where you don't have command authority, where you are neither controlled nor controlling. This is the fundamental change....You no longer evaluate an executive in terms of how many people report to him or her. That standard doesn't mean as much as the complexity of the job, the information it uses and generates, and the different kinds of relationships needed to do the work.**

Overall, the knowledge and skills that pertain to management of relationships are more critical than those that pertain to management of information. The library profession may find within other disciplines, more than within traditional library training, this emphasis on building relationships and creating community.

Within traditional library education there are also some important considerations:

o There is a clear need for a strong common base of principles and practices that transcend and thus can integrate the many institutional faces of library service. Prospective librarians need to learn what it is they have in common.

o They need to learn also what distinguishes librarianship from other players in the information game. This demands not only an understanding of librarianship but of the information context in which the information age library achieves its particular niche.

o Those who would work within the multitype context must be skilled in identification of needs of a broad community -- both a community of libraries and the community of users they represent. This goes far beyond needs assessment but argues for skill in such areas as external scanning, issues identification and management, community analysis, organizational design.

o Another aspect of library collaboration is project management, the need to keep multiple balls in the air at any moment, to work with consultants, project managers, volunteers, advisory groups, and task forces. For the most part, the manager has little line authority over those upon whom the system depends for its effectiveness. There is great need for training in the arts and skill of managing in this non-hierarchical environment. Again, there are models from other disciplines, e.g. management of non-profits.

o In the area of technology there must be more attention to communications technology and to the integration of existing information systems. A high priority for multitype systems is to craft efficient communications systems that assure an ongoing flow of information among multiple institutions, layers of staff, and distributed delivery points. A corollary challenge is to create the links among automation systems, online systems and in-house data bases, created to address the needs of individual institutions rather than the collaborative.

o At a more advanced level there may at some time be a specific curriculum for multitype system management. Such training should include education in management of complex organizations, assessment of the impact of value-added services, measurement of impact.

o There must be incentives for people to explore different types of professional experience in libraries and in other community and information environments. **The present system offers disincentives for the sort of broad work experience that would serve well the multitype system manager.**

o There is need for in-service education for library staff attempting to work through collaborative systems to build the integrated library community represented in multitype systems. Possibilities include:

- education for administrators on the organizational structures of other types of libraries -- e.g. college library administrators on the culture of the public library or public library directors on the structure of schools

- education for all types of librarians on community analysis, systems design, organizational theory

- opportunities for discussion of specific issues that demand a multitype approach: Examples include:

    reform movement in education
    intellectual property rights and copyright
    changes in the publishing environment
    telecommunications
    educating the information user
    services to people with disabilities/assistive technologies
    access to local/state/federal government information

- training in project management with emphasis on specific projects that specifically involve multiple libraries in a common purpose

- opportunities to work in collaboration to improve user education so that users also become co-producers of the value of information and library services

o Professional associations can play a key role in the education and training of personnel for multitype management and participation. The present system which separates library and information workers, their conferences, literature, and missions, runs counter to the cross-pollination necessary for effective collaboration. There must be opportunities for organizations to work together at the national and state levels in a strategic approach to a common agenda on overarching issues, e.g. legislation, standards, accreditation, ethics, research, and training. At the local level, the professional associations can play a key role by extending training and learning experiences, even informal opportunities, to a broad constituency.

o Finally, there is need for boards, particularly public boards, that set policy and practices for multitype systems to understand the unique nature of collaborative systems and the measurements thereof. **Training is necessary in order for board members to appropriately select and evaluate staff, to craft appropriate incentives to support collaborative systems, to evaluate impact as well as transactions completed.** Sources of information and training for board development may well lie within public and nonprofit administration including the literature and training of entrepreneurial corporate management rather than within traditional library settings.

Conclusion

The challenge facing the library community is to craft the models and set the rules that govern and measure institutions that are working in the trenches to "reinvent" public services for an information society. The multitype system has emerged as a model and a positive conduit for change. **Assessment of the services, structures, and, most of all, the impact of multitype systems is the key to an understanding of the complexity, the dimensions and the web of communication and collaboration so essential to library and information services that library users both expect and deserve.**

Traditional measures simply cannot produce a comprehensive picture. Rethinking the basic functions -- the invention of value; co-production of services; capacity building; sustainability; community impact and resilience -- suggests the need for the proverbial paradigm shift. That shift, in turn, expands creative possibilities that are in harmony with much of today's thinking about outcomes, impact, learning organizations, post-capitalist executives, and complex systems.

Librarians and those who govern these wonderfully complex institutions are going to need help from other disciplines which share common values and concerns which libraries traditionally espouse and represent. Libraries and librarians have much to offer as models of collaboration; we have much to learn about ourselves, much to learn about how to express clearly and forcefully the powerful impact of high quality library and information services, and much to offer other disciplines which depend on and contribute to the world libraries and books and a community of readers and thinkers.

It'll be fun!

V. INFORMATION TO ENHANCE PLANNING FOR EDUCATION FOR LIBRARY AND INFORMATION SERVICES PROFESSIONALS:

WHAT DO WE NEED TO KNOW?

An introductory background paper
presented for discussion
by participants in
the Library and Information Services Policy Forum

Washington, D.C.

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by

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INFORMATION TO ENHANCE PLANNING FOR EDUCATION FOR LIBRARY AND INFORMATION SERVICES PROFESSIONALS: WHAT DO WE NEED TO KNOW?

INTRODUCTION

The purpose of this paper is to discuss what information is needed to support planning for education of library and information service (LIS) professionals over the next five years. It will address quantitative questions, identify related professional issues, and suggest policy considerations for data gathering and decision making relative to development of strategies for change in library and information studies education. Although this paper will of necessity incorporate discussion of other library and information services personnel, it is specifically addressed to the professional level and will not, except incidentally, discuss education and training needs for other personnel categories. It will not attempt to provide answers, but will focus on identification of questions to be asked and issues to be considered in determining what is most critically needed to assist suppliers of LIS education to prepare LIS professionals, from both quantitative and qualitative perspectives.

In summary, the paper will try to ask and suggest directions for discussion of the following questions:

- What do we know about the current and short term supply of LIS professionals, and what don't we know?
- What do we know about the current and short term demand for LIS professionals, and what don't we know?
- What would be done with additional information about supply and demand?
- Would additional quantitative data impact the behavior of both suppliers of LIS education and potential entrants to the field?
- What are the forces/changes in the delivery of LIS education, in the profession, and in the provision of information services that will impact planning for education of LIS professionals?
- What are some of the questions that need to be answered in order to support and direct planning for LIS education programs?
- What levels and types of federal assistance could most effectively address the problems in this area?

SUPPLY AND DEMAND

Background

At this time, current full-scale information on the supply of and demand for LIS professionals is not available. There have been two comprehensive supply and demand studies conducted in the past twenty years, one in 1972 and one in 1982. The former, Library Manpower: A Study of Demand and Supply, published in 1975 by the Bureau of Labor Statistics (BLS), [1] was done in response to library community concern over a perceived oversupply of librarians and basically predicted that supply and demand would be in equilibrium over the years 1970–1985. The second study, Library Human Resources: A Study of Supply and Demand, conducted by King Research for the National Center for Education Statistics, [2] projected only very small increases in the demand for librarians over the 1980–1990 time period, with decreases in employment in school libraries, a flat employment outlook overall for academic libraries (although with an increase followed by a decrease), and small increases in public and special library employment. Supply was likewise projected to be comparable at the beginning and end of the time period, although the mix among sources was predicted to shift toward a higher percentage from ALA–accredited master's programs, with declines in new entrants coming from bachelor of library science and school certificate programs. Overall supply was predicted to exceed demand, with most available positions resulting from replacement rather than growth. [3] Differing rates of change in supply and demand were predicted to cause slight improvement in the job market through 1986 and then a tightening due to increased supply relative to demand in the latter part of the decade. [4]

Further work on projecting supply and demand was done by Cooper and Van House, growing out of their work on the King Research project. Cooper developed mathematical models to predict employment levels in different types of libraries based on external variables, relating public library employment to total population and elementary and secondary school enrollment, public school library employment to enrollment changes, academic library employment to total enrollment in colleges and universities, and special library employment to the gross national product and expenditure growth for research and development and national health care. Although the numerical projections differ from those of the King study, the overall picture offered is essentially the same: practically the same employment levels at the beginning and end of the time period (1983–1990), with declines in employment in public school libraries, increases in public and special libraries and steady state or declines in academic libraries, with job openings occurring from replacement, not growth.[5]

Van House, likewise, developed a mathematical model to predict the number of graduates of American Library Association (ALA)– accredited master's programs related to the total number of master's degrees awarded in all fields and starting salary levels for M.L.S. graduates. The latter were also modeled and were related to professional women's salaries, library expenditures, and previous numbers of graduates.

Using these projections as a base, she also projected numbers of entrants to the field from other sources (unaccredited programs, school library certificate programs, reentrants, delayed entrants, occupational transfers). Because of the relationship between numbers of graduates and salaries and the lag time in the effect of one on the other, Van House predicted that the disequilibrium observed in the librarymarket from the 1950s through the 1980s would probably persist, with a continuation of periods of shortage followed by periods of surplus.[6] She projected a recovery in the number of graduates of accredited programs during the decade and a tight employment market, since comparing her supply projections with the demand projections of Cooper indicated oversupply in each year from 1984– 1990.[7]

Although later reports have addressed the supply and demand question in either subcategories of the field or for specific geographic areas,[8] there is no comprehensive later work that addresses the field as a whole in terms of projecting supply and demand figures for planning purposes. However, there are sources of information that provide ongoing information on current supply and demand or have potential for contributing information that could be used to assess levels of supply and demand. The most well-known and widely available are briefly identified below.[9]

Current sources of information on supply and demand

Library Journal Placements and Salaries Survey

Perhaps the most widely used source to measure demand by type of employment for entry–level library and information service professionals is the annual placements and salaries survey that appears, generally in the fall, in Library Journal. Since 1951 this source has provided information about placements and salaries of graduates of ALA–accredited programs. Information is analyzed by type of library, by region, and by gender and also presented by individual school. Numbers of position listings are reported, and comparisons of placement experience with previous years and assessment of areas of shortage are made. In addition, the total number of graduates is reported, indicating the numbers of potential new entrants from accredited programs.

Although providing the most sustained longitudinal data available on supply and demand, these reports must be used with some caution. Prior to the survey for 1989, both U.S. and Canadian schools were included; not all U.S. schools with ALA–accredited programs report data, making the supply figures less than complete and variable (those reporting may differ from year to year); and placement information from the schools is incomplete (for the 1991 survey employment status of slightly over 8 percent was unknown, but this percentage can range much higher).[10] For those not in library positions or for whom employment status is not known, some may later appear as delayed entrants, others may not. The information only indicates demand for positions that was met by new master's recipients from accredited programs; it does not measure positions that were filled by other sources of supply, such as graduates of unaccredited programs and school library certificate programs, reentrants, and occupational transfer; nor does it provide information on demand for positions other than those available to entry-level professionals.

American Library Association Annual Conference and Midwinter Meeting Placement Center Statistics

Statistics are gathered biannually by type of position on the numbers of jobs listed in the ALA Placement Center at each Annual Conference and Midwinter Meeting. Although this information dates back to the 1960s and is a useful source of trend data, it is not published consistently. Data by specific category or by summary categories is made available from time to time in Library Personnel News[11] and has also been included in summary form in other sources.[12] It is also made available on request from the ALA Office for Library Personnel Resources. As has been noted by Myers,[13] this information does not represent the total market, but since it includes the number of job seekers as well as the number of jobs posted, it does provide the opportunity to track the ratio of these two, giving an indication of the match between supply and demand both in total and by type of position. This information has been used on occasion with other data to suggest specific areas of shortage within the field.

As with the previous source, however, this information is not only incomplete but must be used with caution. Job seekers include not only those without jobs in the field (new entrants, reentrants, occupational transfers) but also those with jobs who are seeking to change position. The numbers of jobs listed and the number of job seekers registered are also subject to a number of variables, the effects of which are not known, such as the location of the conference and the prevailing economic climate, both of which affect the total number of attendees and hence the numbers of those seeking and offering jobs.[14]

National Center for Education Statistics (NCES) Library Statistics Program

The Federal-State Cooperative System (FSCS) for public library data, which was piloted in 1985 and began in 1988, now provides annually relatively complete data on the current employment of LIS professionals in public libraries at national, state, and individual public library level, including what percentage of those positions is filled by holders of a degree from an ALA- accredited program. Aggregated state and national level data are published annually in an E.D. TABS publication, the most recent being Public Libraries in the United States, 1991. Data files are also now being made available on diskette, which provides additional data not available in the paper report that can add substantially to what we know about employment profiles in the public libraries of the U.S.[15]

Information on current employment in academic libraries is also gathered through an NCES effort, the survey of academic libraries component of the Integrated Postsecondary Education Data System (IPEDS). Now collected on a biennial basis in even-numbered years and published in an E.D. TABS publication, Academic Libraries, information is available on the number of FTE "librarians and other professional staff" employed in libraries (and positions for which there is an active search) of the higher education institutions with accreditation recognized by the U.S. Secretary of Education. This data, although available for a longer time period than that for public libraries (since 1966), is less precise than that provided in the FSCS survey, both in regard to the inclusion of "other professionals" and in the fact that there is no information on the number or percentage of professional staff holding degrees from ALA-accredited programs.

Comprehensive information is not yet available through NCES data collection on an ongoing basis on school library media specialists (the last most recent national survey on school library media centers was done in 1985/86), but it will be gathered through the Schools and Staffing Survey (SASS) beginning with the 1994 survey. Information to be gathered will include academic background, which should illuminate the relative strengths of the various sources of supply for school library media specialists, as well as demographic and career history information, which should assist in providing additional information on supply as well as movement into and out of this segment of the library labor market. There is also under consideration a follow-up survey to study turnover and retention issues.[16]

Also reported in pretest or planning stages are surveys of state library agencies and federal libraries.[17] Should surveys of these sources of librarian employment be implemented, in addition to the planned inclusion of school library media specialists in SASS, the major areas of the library market left uncovered in regular statistics gathering relative to employment will be non- federal special libraries and the various library networks, consortia, and similar organizations that employ degreed librarians. This latter universe is fairly well identified and would not be unduly difficult to survey. However, whether both this population and the non-federal special library population (which is perhaps somewhat more difficult to completely identify) could be fit directly into the responsibilities of NCES is perhaps a question to be raised. Also unaccounted for will be the nebulously defined and far more challenging to measure nonlibrary market for which there is demand for LIS professionals.[18]

Association for Library and Information Science Education (ALISE) Statistical Report

This report, Library and Information Science Education Statistical Report, issued annually since 1980, provides the most comprehensive ongoing statistical information available about the supply of new entrants to the field. It includes data on graduates of all programs (bachelor's, master's, post-master's, and doctoral) of ALISE member schools, including both those with master's programs accredited by ALA and those without accredited programs, including total numbers of graduates by program, by school, and by sex and ethnicity. Although the best available data on this segment of supply on an ongoing basis, the report, like others, has limitations, most notably that it includes very few schools with unaccredited programs, making it not a reliable source for data on these graduates. In addition, like the LJ Placement and Salaries Survey, it does not always include responses from all schools with ALA-accredited programs, although the response rate is generally very high (ranging from 91.6 to 99.9 percent over the last nine years).[19] It should also be noted that the ALISE statistics and the LJ survey cover different time periods, the former being gathered on an academic year basis and the latter using a calendar year, making any comparisons between the two problematic.

ALA Office for Library Personnel Resources "Degrees and Certificates Awarded by U.S. Library Education Programs"

The ALISE information is used as the basis for reports by other bodies, including the "Degrees and Certificates Awarded by U.S. Library Education Programs," generally issued on an annual basis by the ALA Office for Library Personnel Resources. This report, provided in tabular form, adds percentages to the ALISE sex and ethnicity data for ALA-accredited master's degree, 6th-year certificate, and doctoral degree recipients, and assists in tracking supply by sex and ethnicity. Although this report is made available on request to libraries that need such information for their affirmative action plans, it is not published in a vehicle that is widely distributed. The data available in the Office for Library Personnel Resources actually go back to 1973, predating the ALISE publication.[20]

ALA Office for Library Personnel Resources, Academic and Public Librarians: Data by Race, Ethnicity & Sex

This publication, issued irregularly but usually at five-year intervals (1991 being the most recent), surveys a sample of U.S. public and academic libraries to provide information on the distribution of librarians by race, ethnicity, and sex in both the academic library and public library work forces. Data is presented on the overall work force distribution as well as distribution of directors, deputy, and associate and assistant directors; branch and department heads; and entry level librarians. In addition, the report compares the racial and ethnic composition of undergraduate degree recipients with graduates of LIS master's programs and with academic and public librarians.

NCES, Digest of Education Statistics

The "Bachelor's, master's, and doctor's degrees conferred by institutions of higher education, by sex of student and field of study" table in this annual publication is a source for LIS master's degrees awarded that includes both accredited and nonaccredited programs, based on IPEDS-gathered data. It also gives annual data on bachelor's degrees in the field and on educational media degrees at both levels. However, what is not accessible that influences the school library media market supply is degrees in education that incorporate a library science component sufficient to meet certification requirements. What is also an unknown, but an influence on the total supply, is whether some LIS schools may have degrees (either ALA-accredited or otherwise) appearing in the "information science and systems" or "computer and information sciences, other" categories. Further complicating matters is the category "library and archival sciences, general," where some of the LIS degrees are possibly placed.[21]

Bureau of Labor Statistics, Occupational Projections and Training Data

This publication, issued biennially as a supplement to the Occupational Outlook Handbook, provides projections of total employment; employment change for a fifteen-year period; annual average job openings for the period, both total openings from growth and replacement needs and growth plus net replacement needs; annual average replacement needs; and percent distribution of employment by selected industry by occupation, including professional librarian. Although this source gives projections not available elsewhere, the data are national level data and are for the occupation as a whole, thus not offering projections on the variations of demand within the segments of the library market.

Other Sources and Additional Missing Information

In addition to these sources, there are other possibilities for gathering data on position openings. Placement sources listed annually in "Guide to Employment Sources in the Library and Information Professions" in the Bowker Annual of Library and Book Trade Information, prepared by Margaret Myers, Director, Office for Library Personnel Resources, American Library Association, include library joblines and placement and referral services offered by associations and state libraries; publications that carry ads; commercial placement services and employment agencies specializing in library and information positions; federal sources of job information; more general sources and sources for particular market segments; and overseas job sources. At present there is no systematic attempt to track the numbers of positions listed by these sources. Aggregated and cleaned for duplication, the positions listed by these sources would collectively be a basis for information on job openings, but like the LJ survey and the

ALA Placement Center statistics, would be incomplete in what are likely unpredictable and undeterminable ways.

Data on projected supply and demand at the state level is generally not available on any regular basis. A recent study conducted by Rees and Du Mont of human resources needs in Ohio libraries is an example of the kind of report that would be useful to have at the state level on a recurring basis.[22] A survey of state library agencies conducted a few years ago by the ALA Office for Library Personnel Resources did not find projection of need being done on a regular basis by those agencies, although projections on need for librarians, along with other occupations, is included in the work of some of the state level employment security offices or departments of labor.[23] The ALA Office for Library Personnel Resources and the American Association of School Librarians have also surveyed state departments of education concerning their staffing needs in school library media centers, but the results are unpublished.[24]

Other areas in which there is no national data include retirement patterns for librarians. In a recent publication, Myers points out that although it is possible to project the number of librarians who will reach 65 by given dates, we don't know if they will retire then or not.[25] A nonscientific survey of retirement trends in libraries conducted in 1989 by Library Personnel News indicated that although retirement at 65 was still the norm, other patterns were emerging.[26] We also don't know anything about whether those retiring will be replaced and, if so, if replacement will be in the same work category. We do know that, in general, the librarian work force tends to be older than other professional occupations.[27] Given the rapid change taking place in the ways in which library and information services are delivered, to predict replacement needs even by functional work area based on categories of those retiring would seem risky at best.

The best information available related to predicted retirement patterns is on the retirement of faculty in library and information studies education programs. Predictions there are sufficient to cause alarm over the continued availability of a source of education for librarians for the future, regardless of the fluctuations of demand. A study conducted by Futas and Zipkowitz in 1989 projected that by 2000 half of the faculty in LIS schools will have retired, with 300 retirements occurring in 1991-1997.[28]

As noted above, we have very little information on demand levels, either current or projected, in information positions outside libraries. We have some tracking of the extent to which graduates are taking such positions on initial employment after receipt of the master's degree, but we do not know current migration patterns from library positions into these other areas, although this was measured in the 1982 King study at 9 percent of those who change jobs.[29] We also do not have current data about the total size of the information professional work force. The Occupational Survey of Information Professionals conducted in 1980 estimated 1.6 million information professionals in the U.S. at that time.[30] Although there have been reports of plans for an update of this survey, it has not yet appeared.

What We Know

What currently available data sources tell us about the supply and demand for librarians is the following. The current annual supply of master's degree holders from U.S. ALA-accredited programs, who are potential entrants to the field, has risen to over 4686 (for 1991/1992, one school missing from the data; total including Canadian schools is 5128),[31] continuing the general recovery trend that has been observed since 1985/86:

YEAR	MASTER'S DEGREES AWARDED
1981/1982	2975
1982/1983	2754
1983/1984	3010
1984/1985	2620
1985/1986	2832
1986/1987	3276
1987/1988	3160
1988/1989	3522
1989/1990	3686
1990/1991	4266
1991/1992	4686 [32]

According to the Bureau of Labor Statistics, total employment for professional librarians in 1990 was 149,000, with the number for 2005 projected at 165,000, a total increase over the time period of 11.4 percent. Growth plus net replacement needs is estimated at 4000 jobs per year, of which 3000 are replacements. The replacement rate will be higher in the last five years of the period than in the first five (a ratio of 1.2).[33]

The BLS figures for the number of librarians is lower than that given by the ALA Library and Information Center for "librarians and other professionals," computed using sources from the most recent NCES publications covering the major types of libraries, which gives a total of 151,554.[34] This figure, while it may or may not be closer to actuality than the BLS figure of 149,000, illustrates the difficulty in any accurate count using current data sources: it is a composite of figures from varying years (1982–1989) and includes the "other professionals" that are included in the academic libraries NCES survey category.

Position openings listed at the ALA Placement Center at the 1993 Midwinter Meeting and Annual Conference numbered 395 and 524, respectively. Annual Conference listings were the lowest since 1983 (509), considerably down from the numbers the last half of the 1980s, but consistent with the pattern of the previous two years.

ANNUAL CONFERENCE YEAR	NUMBER OF JOBS LISTED
1986	725
1987	885
1988	908.5
1989	921
1990	917
1991	582
1992	529
1993	524 [35]

Since 1989, the ratio of job applicants to jobs listed has changed from .91 to 2.08, a dramatic shift in four years.[36]

During the mid 1980s shortages began to be reported in a number of specific areas, most notably in technical services and youth services (including school media), but also for positions requiring backgrounds in science, languages, business, and engineering.[37] These shortages are presumed to be continuing: an ALA fact sheet of July 1992 cites the same areas,[38] and the 1993 priorities for HEA Title IIB fellowships recognized similar areas.[39]

We do not know, however, based on empirical evidence, that these shortage areas continue, at least to the same degree that they appeared, based on experience, to exist in the mid 1980s. Although certainly not conclusive evidence, ratios of job seekers to jobs listed in the technical services and youth services categories in the Placement Center at the last two ALA Annual Conferences suggest that the undersupply in these areas has been corrected. In the survey conducted by the ALA American Association of School Librarians and the Office for Library Personnel Resources in December 1991 of state departments of education concerning their projected staffing needs in 1992–93 and expectations for change in demand for school library media specialists between 1991 and 1997, the responses indicated the large majority expected either a decrease or steady state for 1992–93, although expectations of more than half were that the number of school library media specialists employed would increase between 1991 and 1997.[40]

We do know that despite sustained efforts to increase the diversity within the professional librarian work force, it remains overwhelmingly white (87.67 percent for academic and public libraries).[41] Even more discouraging, in 1979–1980, the total minority representation in ALA–accredited master's program degrees received in the U.S. was 9.6 percent; in 1989–1990, it was 9.3 percent,[42] suggesting not only no progress but, in fact, regression. What we have not considered on an ongoing basis is the percentage of the available minority pool that we are attracting vis–a–vis other professions. The most recent Academic and Public Librarians: Data by Race Ethnicity & Sex shows that racial and ethnic composition of the librarian work force in academic and public libraries roughly parallels the racial and ethnic profile of undergraduate degrees awarded for 1986–87. However, it also shows lower percentages of the various minorities groups in the master's degrees awarded by ALA– accredited programs for 1989–90, suggesting a loss of position.[43] What is not examined however, is the percentage of those receiving undergraduate degrees who continue in graduate or professional programs or the profile of LIS graduate students and all graduate students. Nor have we had the kind of ongoing comparison with other fields that Estabrook presents in the summary chapter of the 1993 ALISE Statistical Report, which compares LIS with nursing, computer science, social work, and business.[44] Such comparisons would assist in providing a more complete assessment of the relative success or failure of the field in the area of recruitment of minorities.

The current paucity of reliable data for use in planning and the apparent slow reaction time of the field both in correcting the perception of the prevailing relationship between supply and demand as well as the slowness with which the market reacts, [45] have led some library educators and others to call for a new supply and demand study. [46] However, before coming to the conclusion that such a study should be conducted it is well to consider whether such new information, particularly information that is only provided on a one-shot, every ten years or so basis, will actually be the most useful and appropriate addition to the information base.

Impact of Additional Supply and Demand Information

In addition to not knowing what the projected need is for librarians and what areas are likely to be in most (and least) demand, we do not know how such information would be used and what impact it would have on either the suppliers (the LIS schools) or the consumers (the potential students). We do not know how the 1982 King report was used or what influence it actually had. Matarazzo speculates that the report and others of the same tone, which indicated a tight job market in the last part of the eighties, could have been used to conclude that the area was not a promising one, and hence the decline in numbers of graduates. In addition, he points to the broadening of the LIS education programs to expand to preparation of students for the nonlibrary information market. [47] However, we do not really know how the 1975 BLS study or the 1982 King report were used, or if new data would be used by schools to adjust supply, by either reducing or increasing the numbers of graduates or shifting areas of specialization. Although job market conditions and areas of projected shortage or oversupply are pointed out both to prospective students and to those enrolled during the advising process, we have no data that indicate that such information changes the career direction or the program of enrolled students. Nor do we have any reason to believe it has impact on curriculum revision or changes the composition of the faculty.

We have had studies of why students choose the field in the first place and what influences the individual choice of school; [48] we know less about why the first position is taken. Is it because the job was in a high demand area, in the right location, in the area studied for in the master's program, the only job offered? We do know that the majority of students enrolled in LIS schools perceive themselves to be geographically bound and hence constrained in their choice of the first position, [49] although we don't know if that geographical constraint is actually operable or the dominant factor in the first position accepted. There is evidence that the type of library preferred at graduation and that of the first position matches for only slightly more than half of the master's graduates and that the match between area of expected specialization at enrollment and that of the first job is below 50 percent, [50] raising questions about whether even if students are recruited into high demand areas that they would actually end up in positions in those areas.

As for the impact on decision making relative to curricula and faculty of LIS schools, even with perfect supply and demand information, it is highly unlikely that schools would be able to respond in a fashion that would help maintain market equilibrium. Decisions on enrollment levels, on areas of faculty expertise, and on curricula change are driven by a complex set of factors, of which market considerations are only one. Depending on the degree to which allocation of resources in an institution are enrollment or semester credit hour production driven, shortages or oversupply may not impact the behavior of the school vis-a-vis numbers of students. For those schools whose institutions are heavily market driven, an oversupply of librarians is not going to cause the school to voluntarily reduce semester credit hour production. In fact, such a situation may just produce more intense recruitment. For some schools in institutions with tightened resources (the case for most), increased student numbers may not result in any increase in resource allocation, and in such situations schools may use self-imposed caps on enrollment. Hence a shortage of librarians will not drive up student numbers; it will just raise entry requirements by providing more applicants and a larger pool from which to select.

Faculty and curriculum areas of specialization and emphasis, while they do change, do so through a process that is usually too lengthy to respond to the cyclical fluctuations of the various segments of the library market. It can take one to two years to accomplish even minor curriculum reform within the school (addition of a new course, for example), plus at least another year's lead time to get the required approvals at university and higher levels (such as board of regents and a state level higher education body). Overall curriculum revision can take substantially longer, four years or more.[51] Hence curriculum change, while both necessary and continual, must of necessity respond to the larger, overall substantive changes in the field, rather than those that are of a more temporal nature.

The same is true for faculty changes. New faculty are integrated into an existing one and are selected with an eye toward the longer term strategic direction of the school and not short term market conditions. By the same token, faculty retooling is driven by similar considerations.

Both curriculum change and faculty directions are influenced more by the host institution and its expectations than by the immediate needs and the expectations of the profession and the library market. As Estabrook notes in the summary chapter of the 1993 ALISE Statistical Report, "to remain viable, each school needs to meet the criteria of quality, centrality, demand and reasonable cost in its home institution." She cites Robbins, who has observed that schools "survive alone."[52] While these facts of life in academe need not drive us into the we-they, academe versus those "whose work and loyalties are devoted to libraries and librarianship" camps that are suggested in a recent Library Journal editorial,[53] it is necessary to recognize the differing stance relative to the appropriate response to supply and demand imbalance taken by those in the LIS schools and those who are practicing librarians.

FORCES OF CHANGE AND INFORMATION NEEDED FOR PLANNING

At the current time, perhaps the most pressing issue facing both the LIS schools and the profession--and one which is not divided into camps, at least along those lines--is the rapidly changing nature of the entire information infrastructure and the changing systems and services for information delivery. The questions that are most difficult to answer, but which are most critical to the issue of the adequacy of existing programs to prepare library and information professionals for the next century, are what those professionals will need to know and in what types of environments and structures they will work, i.e., what are the requirements for and the characteristics of the librarian we will need five years from now? If LIS schools are to be able to respond to the "need for trained librarians," that is certainly the major issue we need to address. The educational question then becomes, are the current curricula of the schools adequate to deliver that educational product, not, how many of those do we need and how do we control production.[54]

Martin Dillon's paper will have addressed these issues in terms of the changes that can be expected and the impact and implications for the characteristics of the librarians that will be needed to work in the future information environment. Once those characteristics have been defined, the challenge for the schools will be to ensure that their curricula and faculty are equal to the task of educating such librarians and that the education is available. Some consensus on the likely nature of information service and delivery in the future is needed if curriculum adaptation and revision by the schools is to be successful in ensuring the adequacy of programs to prepare librarians for that future. The question of how best to ensure availability of education is another critical one that needs to be answered in order to assist LIS education programs in their planning. We know that location is the single biggest factor influencing the choice of an LIS program.[55] We also know that access to the dominant suppliers for entry into the profession for all but the school library media segment, the schools with ALA-accredited programs, is not well distributed geographically in terms of location of the host institutions. There are currently 16 accredited programs in the Northeast, 13 in the Southeast, 11 in the Midwest, 5 in the Southwest, and 5 in the West, one of which is not currently allowed to admit new students for fall 1994 and another which has only within the past two months been granted permission to do so.[56] Large areas of the country do not have ready access to accredited LIS programs; U.S. programs are located in 30 states, Puerto Rico, and the District of Columbia.

Increasingly, access is being extended to unserved areas through a variety of delivery methods, ranging from physically transporting faculty by car and plane to off-campus sites to instructional delivery through various means of telecommunication that include closed circuit two-way video and audio, open circuit television broadcast, closed circuit one-way video, two-way audio, video cassette, and video tape. In 1991-1992 forty-one ALA-accredited program schools offered a total of 660 courses off the home campus, including fourteen schools that used some form of telecommunications delivery.[57] There is no current survey that regularly presents data on which schools deliver the entire program off–campus, how many previously unserved states the extension of offerings now reach, or the total number of students served by courses offered off the home campus. Some of that data have been reported regularly to the American Library Association Committee on Accreditation; but, due to the confidential nature of reports submitted to that body, it has not been publicly available.[58] We also do not know the extent to which availability of accredited programs in previously unserved areas is changing the quality of delivery of information services, the employment of librarians with accredited master's degrees in those states now reached through distance education, or the demand for librarians in those areas. Other issues related to distance delivery that need exploration include acceptability of the concept of the distance education degree within the profession, especially as delivery moves increasingly away from traditional modes; need for new organizational structures that can deliver distance education and still meet accreditation requirements, such as a "virtual library school" that might be composed of courses offered through a variety of host institutions; and impact of increased accessibility on the already complex relationship between the supply and demand for degreed librarians.

Other factors that influence planning by LIS schools include the impact of externally or professionally mandated requirements, generally through some form of certification, and the related possibility that credentialling through certification can be achieved without the current formal master's education program. Although certification is required for school library media specialists in all states, the specific requirements to achieve certification still are not standardized, vary considerably from state to state and generally do not require the master's degree, [59] despite the position of the profession that it is the appropriate first professional degree. [60] Certification for public librarians is mandatory in twenty–three states, permitted in two, voluntary in six, and not available in nineteen. As with school library media specialists, the requirements vary and in states with mandatory certification the requirement may only apply to certain categories of public librarians (like heads of county libraries, librarians in libraries serving over a certain size population, and positions supported by public funds). [61] Where there are specific certification requirements that are substantive and not merely quantitative in nature, these requirements can act as a constraint on the ability of schools to adapt curricula to changing needs, depending on the flexibility of the requirements, the difficulty in getting programmatic changes approved as meeting the requirements, and the extent to which the individual school seeks to serve the market influenced by the requirements.

Alternative routes into the profession via a process of certification through experience, testing, or whatever means, other than the route of formal educational requirements, will also impact the already complicated supply and demand equation. Although schools may not respond well to market changes, the alternative routes have the potential of adding even further unpredictability to the levels of supply.

One further complicating factor, and one that it is difficult to assess quantitatively, is the degree to which the technological changes described by Martin Dillon not only will change the nature of professional work but also will shift work from professional to support staff categories of personnel. The distinction between the two, although at one time clear in professional rhetoric, has been decidedly murky in practice; and previous experience with increased use of technology suggests it accelerates the extent to which previously "professional" tasks are assumed by support staff, changing the ratio between the two and certainly having some impact on the demand for those with the professional degree.

As noted above, technological change will make it highly probable that librarians who retire, at whatever rate and age, will not be replaced in the same position and perhaps not in the same position category, even if a replacement is hired. The same situation, though for slightly different reasons, is likely true for the retiring library and information studies faculty. Although the Futas and Zipkowitz study raised concerns about areas of the field in which faculty are projected to either leave teaching prior to retirement or retire sooner or in larger percentages than in other areas,[62] it is likely that some of those faculty, if not most, will not be replaced by persons teaching in the same areas or with the same specialties, assuming there is curricular change as substantial as the changes expected in practice.

QUESTIONS TO BE ANSWERED, SUGGESTED APPROACHES, AND POSSIBILITIES FOR FEDERAL ASSISTANCE

This paper has already identified a number of areas in which the information that we have is either out of date, incomplete, not comparable, or unavailable on a regular basis in readily accessible publications. Key questions that need to be addressed relate not just to the quantitative issues but also, and perhaps more critically, to the curricular implications of technological change and to issues of access to LIS education, both to supply entry level personnel and to update those already in the field who may not be prepared to function in the electronic information environment.

There are a number of approaches that can be taken relative to quantitative concerns that could be helpful and that would not require total revamping of current efforts. The following are offered as suggestions for discussion.

* **Publish available data in vehicles that will reach the audience that can use it.**

As noted at various points above, there is data that is gathered relative to supply and demand for librarians that is not made available in published form or not disseminated to a wide enough audience to have impact on perceptions or actions. An example is the data gathered by the ALA Office for Library Personnel Resources and the American Association of School Librarians on projections of needs for school library media specialists by state departments of education.

* **Summarize and publish on a regular basis available data gathered by state level departments of labor or other similar agencies.**

Projection data on the need for librarians is available from at least some of the various state bodies that have responsibility for labor and employment. If this data were routinely captured, summarized, and published in a vehicle that reached the library market, it would enrich our information base at both state and national levels.

* **Continue the development of the NCES Library Statistics Program to incorporate the areas of the library market not yet covered by current efforts and continue to work toward enhanced comparability in the data gathered.**

The expansion of the data gathered in the SASS to include comprehensive information on school library media specialists and the development of surveys of both state library agencies and federal libraries is very encouraging. If the non-federal special libraries and the library consortia, cooperatives, and systems could be brought into this overall data system, the possibility of developing reliable forecasting data for the field as a whole would be much improved, in addition to providing a more accurate picture of the current demand than it is now possible to draw.

- **Identify needed information that could be obtained through data elements that could be incorporated into existing surveys and add them; or if already there and not made available, expand the analysis and publication.**

An example would be the number of students and geographic areas reached by LIS distance education delivery. This information could be incorporated into the ALISE survey and statistical report.

- **Reexamine and reconsider the Cooper and Van House models to determine whether updating the external independent variables yields more accurate projections and attempt to fine tune the models to improve their predictive power.**

Before trying to derive new models, it would be well to continue work with ones that have already been developed.

- **Update the Occupational Survey of Information Professionals.**

As is the case with the Cooper and Van House models, a process and a methodology is already developed. Updating this survey could provide the basis for developing projections of supply and demand in the broader information profession, of which librarians are a component.

- **Examine the experience of related or similar professions to see if they have faced comparable problems in terms of the fluctuations of supply and demand, difficulties in maintaining balance, lack of progress in increasing the cultural diversity of the profession, and rapid technological change. Consider how these other groups have solved or are attempting to solve these problems.**

There is much to be learned by broadening our horizon and looking beyond our own experience. As suggested above, we need to be measuring what we do by more than internal benchmarks.

Some of the questions that need answering relative to the impact of technological change on curriculum could be addressed by more productive opportunities for ongoing dialogue between the schools and those who will employ their products. Much of what has served for dialogue between the two in the past has been more diatribe than dialogue. The following suggestions are made to stimulate discussion.

- **Design, fund, and implement a national level effort to assist schools and their constituents in designing and implementing systems for curricula assessment and revision.**

As discussed above, curriculum reform and revision, which is likely to be needed to respond adequately to technological change, is a lengthy process, and it is also one that is heavily labor intensive. What could be of considerable assistance to the schools would be development of ongoing assessment and evaluation mechanisms that would provide continuing feedback to inform curricula decision making and adjustments in program directions, to the extent that such changes are feasible within the host institutional environments. Such assessment and evaluation processes are, in fact, a requirement of the Standards for Accreditation of Master's Programs in Library & Information Studies 1992. The development of systematic mechanisms for regular and ongoing assessment would continue to bear results over time.

The problem of access to LIS education, which is being addressed by an increasing number of schools in a number of ways, could be addressed as well by a national level effort directed toward enhancing alternative delivery systems, the capabilities of faculty to effectively deliver in new modes, and research efforts to answer the many unanswered questions in this area. Barron has recently raised a series of questions that need to be discussed by the profession related to this area, including many that relate to our attitudes and perceptions. He has also suggested a number of actions to be taken by the library and information studies education community, including creating opportunities for faculty "to learn more about adult learning, instructional design, instructional strategies, and instructional technology" and more opportunities for them to "experiment with new techniques and technologies."[63] Possibilities for addressing this issue would include the following.

- **Convene a federally funded national level conference on LIS distance education to explore the attitudinal, pedagogical, legal, and technical issues related to delivery of LIS education by alternative modes.**

A conference similar to the Invitational Symposium on Emerging Critical Standards for Distance Higher Education held in Albany, New York, in November 1990 could afford the opportunity for the affected communities to come together to discuss the issues and to plan means for further mechanisms to continue dialogue and development of expanded access through distance delivery to LIS education for both entry level and continuing professional education.

- Target experimentation with, development of, and expansion of the opportunities for distance education delivery as priorities in federal assistance programs, such as the Higher Education Act Title IIB Fellowships and Research and Demonstration Projects.

Support of distance education delivery of LIS education as policy at the national level would accelerate the solution of access problems, not just by the fiscal impact, but more significantly by the attention it would focus on this area.

CONCLUSION

It is hoped that these suggestions will stimulate others as this paper is read and as the area is discussed during the Library and Information Services Policy Forum. These latter suggestions, while not directly associated with the need to gather quantitative data, are made from the position that the urgent issues related to education of library and information service professionals require multiple approaches to their solution, including both quantitative and qualitative means.

1. U.S. Bureau of Labor Statistics, Library Manpower: A Study of Demand and Supply (Washington, DC: U.S. Government Printing Office, 1975).

2. King Research, Library Human Resources: A Study of Supply and Demand (Washington, DC: National Center for Education Statistics, 1983).

3. Ibid., pp. 2–4, 112, 117.

4. Ibid., pp. 110, 114.

5. Michael D. Cooper, "Projections of the Demand for Librarians in the United States," Library Quarterly 54 (1984): 331–67. No model was developed for nonpublic school library employment and no projections were made for nonlibrary information professional employment.

6. Nancy A. Van House, "Projections of the Supply of Librarians," Library Quarterly 54 (1984): 368–95.

7. Ibid., pp. 390–91.

8. For example, see Philip M. Turner and J. Gordon Coleman, "School Library Media Specialists in the United States: Supply and Demand," School Library Media Quarterly 16 (Fall 1987): 61– 65; Janet Swan Hill, "Wanted: Good Catalogers; the Applicant Pools Seem to Have Dwindled," American Libraries 16 (November 1985): 728–30; and Alan M. Rees and Rosemary R. Du Mont, Study of Library Human Resources in Ohio Libraries 1991 (Kent, OH: Center for the Study of Librarianship, School of Library and Information Science, Kent State University, 1991).

9. The list is not meant to be comprehensive and omits some of the sources that cover only selected portions of market segments that would be included in broader sources, such as the annual ARL Statistics.

10. Fay Zipkowitz, "Placements & Salaries, 1991: Jobs Tight, Salaries Holding," Library Journal 117 (October 15, 1992): 31. Margaret Myers reports this unknown percentage as ranging up to 25–30 percent ("The Job Market for Librarians," Library Trends 34 (Spring 1986): 647.

11 Reports by job classification appeared for the 1989 Midwinter Meeting in Library Personnel News 3 (Spring 1989): 19 and for the 1989 Annual Conference in 3 (Fall 1989): 56. Summary information was reported for 1990 Midwinter in 4 (Spring 1990): 23.

12 Myers, p. 649.

13. Ibid., p. 648.

14. For example, the number of applicants at the Annual Conference in 1979 was 745 compared to 1373 in 1978 and 1184 in 1980 (Myers, p. 649). The variation may relate as much to the locations of the conferences (Dallas, Chicago, and New York respectively) as to the relative supply of librarians. Non- conference attendees may register as job seekers and as employers offering positions, so that the number of those who potentially could use the placement center is not limited to attendees. The impact of location is still a factor, however.

15. For an example of the types of information that can be gleaned from the data, see Mary Jo Lynch and Keith Curry Lance, "M.L.S. Librarians in Public Libraries: Where They Are and Why It Matters," Public Libraries (July/August 1993): 204–7.

16. "Plans for Library Statistics Program," Programs and Plans of the National Center for Education Statistics, 1993 edition, ed. by Celestine Davis and Bill Sonnenberg (Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, 1993), p. 27.

17. Ibid.

18. Examples of nonlibrary market employment range through such varied positions as database designers, database administrators, research associates in executive search firms, and positions in information brokerage firms. The publishing and library supplier and vendor industries are also important segments of this nonlibrary market.

19. Timothy W. Sineath, "Introduction," Library and Information Science Education Statistical Report 1993 (Raleigh: Association for Library and Information Science Education, 1993), p. xxiv.

20. Notes provided to the author by Margaret Myers, Director, ALA Office for Library Personnel Resources.

21. One can conclude that the library science category alone probably does not cover even all the ALA-accredited programs by comparing the 1989/1990 data from this source with the 1989/1990 ALISE data. The NCES Digest of Education Statistics, 1992 ed., gives 3187 master's degrees in library science in 1989/1990 (p. 250); the ALISE data show 3686.

22. Rees and Du Mont. Another study in this category is Katharine T. Scarborough, The Need for Librarians in California: Report on a Survey of the State's Libraries (Sacramento: California Library Association, 1987).

23. Margaret Myers, telephone interview, 26 August 1993. An example of the kinds of information that is available from state occupational outlook reports is found in Myers, "The Job Market for Librarians," p. 659. Also, the BLS Occupational Projections and Training Data, 1992 edition, includes an appendix, "Sources of State and Local Job Outlook Information," that lists the position title and agency name for sources of information for each state, with addresses and telephone numbers (pp. 93–96).

24. Margaret Myers, notes provided to the author.

25. Margaret Myers, "Issues and Options: Education for Traditional Roles or Alternative Careers," in Educating Black Librarians, Papers from the 50th Anniversary Celebration of the School of Library and Information Sciences, North Carolina Central University, ed. Benjamin F. Speller, Jr. (Jefferson, NC: McFarland, 1991), p. 106.

26. "Retirement Trends in Libraries," Library Personnel News 3 (Summer 1989): 36.

27. According to information provided by Elizabeth McGregor, Office of Employment Projections, Bureau of Labor Statistics, U.S. Department of Labor, to the ALA Office for Library Personnel Resources, based on Current Population Survey data, the median age of librarians is 43 while that of other professional occupations is 39, and twenty percent of librarians are over 55.

28. Elizabeth Futas and Fay Zipkowitz, "The Faculty Vanishes," Library Journal 116 (September 1, 1991): 151.

29. Van House, p. 391.

30. A summary of the findings of the survey is in Donald W. King, et al., "A National Profile of Information Professionals," Bulletin of the American Society for Information Science 6 (August 1980). The full report is in Anthony Debons, et al., The Information Professional: Survey of an Emerging Field (New York: Marcel Dekker, 1981).

31. Computed from tables in Library and Information Science Education Statistical Report 1993, pp. 120–26.

32. Based on figures from ALA Office for Library Personnel Resources, "Degrees and Certificates Awarded by U.S. Library Education Programs," for 1981/82 through 1989/90. Figures for 1990/91 and 1991/92 derived from the ALISE Library and Information Science Education Statistical Report, 1992 (pp. 134– 42) and 1993 (pp. 120–26).

33. Bureau of Labor Statistics, Occupational Projections and Training Data, 1992 ed. (Washington, DC: U.S. Government Printing Office, 1992): pp. 18, 81.

34. American Library Association Headquarters Library and Information Center, "ALA Library and Information Center Fact Sheet 2" (Chicago: ALA, May 1992).

35. American Library Association Placement Center Statistics for 1986–1993 Annual Conferences and 1993 Midwinter Meeting.

36. Computed from American Library Association Annual Conference Placement Center Statistics for 1989–1993.

37. Myers, "The Job Market for Librarians," pp. 653–54. See also Hill; Turner and Coleman; and Mary Somerville, "Facing the Shortage of Children's Librarians," American Libraries 18 (June 1987): 418–19 for examples. Turner and Coleman found both shortages and surpluses, resulting from lack of mobility (p. 64).

38. "Librarians: Professionals in Demand," American Library Association Fact Sheet, 7/92, p. 2.

39. U.S. Department of Education, Office of Educational Research and Improvement, Library Programs, "Invitation to Apply for New Awards for Fiscal Year 1993," Federal Register 57 (July 28, 1992): 33411.

40. Notes provided by Myers.

41. American Library Association Office for Library Personnel Resources, Academic and Public Librarians: Data by Race, Ethnicity & Sex, 1991 (Chicago, 1991): Table 7.

42. American Library Association Office for Library Personnel Resources, "Degrees and Certificates Awarded by U.S. Library Education Programs 1979–1981" (Chicago, 1982), p. 4; "Degrees and Certificates Awarded by U.S. Library Education Programs 1989– 1990" (Chicago, 1991).

43. American Library Association Office for Library Personnel Resources, Academic and Public Librarians: Data by Race Ethnicity & Sex 1991, Table 7.

44. Leigh Estabrook, "Summary and Comparative Analysis," in Library and Information Science Education Statistical Report 1993, p. 329. Estabrook also compares LIS graduate students to the total U.S. graduate student profile, showing LIS below the total profile in all race and ethnic categories except African American (p. 325).

45. In Van House's model for predicting numbers of master's degrees, for example, the salary variable was composed of the starting salaries of the previous four years, the range of time in which salary levels influence potential students. She notes the delayed reaction between salaries and numbers of graduates produces a tendency for the market to overcorrect (Van House, p. 376). Cooper also noted the lag time in reaction to changes occurring in the school segment of the market, where the impact of enrollment changes is not accounted for in levels of librarian employment in school systems until seven years later (Cooper, p. 344).

46. For example, in 1989, James M. Matarazzo, called for "a new projection of supply and demand for library human resources," to be "carried out quickly," to address what he judged to be a "lack of consensus on the issue of supply and demand for the profession" (James M. Matarazzo, "Library Human Resources: Too Many or Too Few, " Library Personnel News 3: [Summer 1989]: 37). Economist Deborah Selsky, arguing that the Bureau of Labor Statistics projection of numbers of new jobs per year did not accurately represent the total picture, given likely retirements, unfilled positions, and possible improvements in public sector employment, called for a "thorough national assessment of the need for librarians," to provide "solid data" ("The Employment Outlook," Library Journal 115 (January 1990): 42.

47. James M. Matarazzo, "Recruitment: The Way Ahead," in Recruiting, Educating and Training Cataloging Librarians: Solving the Problems, ed. Sheila S. Intner and Janet Swan Hill (New York: Greenwood, 1989), pp. 25, 27.

48. Nancy A. Van House, "MLS Students' Choice of a Library Career," Library and Information Science Research 10 (1988): 157- 76; Kathleen de la Pena McCook and William E. Moen, "Patterns of Program Selection: Ranked Factors in the Choice of a Master's Degree Program in Library and Information Studies," Journal of Education for Library and Information Science 33 (Summer 1992): 212-25. See also, Kathleen M. Heim and William E. Moen, Occupational Entry: Library and Information Science Students' Attitudes, Demographics and Aspirations Survey (Chicago: American Library Association, 1989).

49. William E. Moen, "Library and Information Science Student Attitudes, Demographics and Aspirations Survey: Who We Are and Why We Are Here," in Librarians for the New Millennium, ed. William E. Moen and Kathleen M. Heim (Chicago: American Library Association Office for Library Personnel Resources, 1988), p. 105.

50. Herbert S. White and Sarah L. Mort, "The Accredited Library Education Program as Preparation for Professional Library Work," Library Quarterly 60 (July 1990): 200, 204.

51. For a comprehensive description of the process of major curriculum revision see Suzanne Bertrand-Gastaldy, Paulette Bernhard, and Jean-Marc Cyr, "Reconstructing a Master's Degree Program in Library and Information Studies: The Universite de Montreal Experience," Journal of Education for Library and Information Science 34 (Summer 1993): 228–43. The curriculum revision described was begun in Spring 1986 and concluded Spring 1991 (pp. 238–40).

52. Estabrook, p. 323.

53. John N. Berry, "The Two Crises in Library Education," Library Journal 118 (September 1, 1993): 102.

54. A useful source that provides access to some of the recent literature on competencies needed for information professionals, as well as recent articles on the library labor market, is Susan S. Turner, Library/Information Professionals: Competencies and the Labor Market, Annotated Bibliography (Chicago: American Library Association office for Library Personnel Resources, 1992).

55. McCook and Moen, p. 222.

56. The LIS program at UCLA was given permission to admit for fall 1994 in mid-July. As of this writing, admissions are still suspended at the University of California, Berkeley School of Library and Information Studies.

57. Library and Information Science Education Statistical Report 1993, pp. 252–56.

58. Actually, the number of FTE students enrolled in off-campus courses is gathered in the ALISE data, but it is not included in the published report.

59. A summary of requirements in all states is given in Patsy H. Perritt, "School Library Media Certification Requirements 1992 Update," School Library Journal 38 (June 1992): 30–49.

60. Policy 54.2.2 "School Library Media Specialists," in "ALA Policy Manual," ALA Handbook of Organization 1992/1993 (Chicago: American Library Association, 1992), p. 147. The master's degree may be either from an ALA-accredited program or from a unit accredited by the National Council for the Accreditation of Teacher Education.

61. American Library Association Office for Library Personnel Resources, Certification of Public Librarians in the U.S. ([Chicago]: 1990). Some states may have changed their certification laws since this publication, which is the most recent compilation.

62. Futas and Zipkowitz, p. 152.

63. Daniel L. Barron, "Perceptions of Faculty and Administrative Staff in ALA-Accredited Programs toward Part-Time and Distance Students in LIS Education," Journal of Education for Library and Information Science 34 (Summer 1993): 196–98.

VI. STATISTICAL SUPPORT FOR URBAN LIBRARY SERVICES

An introductory background paper
presented for discussion
by participants in
the Library and Information Services Policy Forum

Washington, D.C.

September 23-24, 1993

by

Eleanor Jo Rodger

Introduction

The late Kenneth Boulding, economist and poet, was fond of observing that statistics are like bikinis, what they reveal is interesting but what they conceal is essential. The statistical methods and data available to managers of urban public libraries certainly reflect the truth of Boulding's observation. It is interesting to know how many books circulate and how many questions are handled, but when policy makers ask what difference it makes to have a good library in a community, we often resort to fuzzy and unsatisfactory language about quality of life rather than answering their reasonable question.

The intent of this paper is to provide a starting place for naming and framing some of the issues involved in identifying and developing the statistical bases we need to focus our attention and resources on effective public library services. Many issues, such as the impact of technology on urban library services, will not be addressed because others are doing so as a part of this forum. No claims to comprehensive treatment are even suggested. What is hoped is that some of the groundwork can be developed for statistical systems which will enable urban libraries to make wise and bold decisions, and to communicate effectively about what they are doing with the public (and increasingly also the private) money they are given.

Authorizing and Funding Environments. The environments for decision making in urban public libraries are challenging. Many urban areas are dying. In his recent book, Cities Without Suburbs, David Rusk lists a dozen cities which he believes have passed the point of no return. His conclusions are based on three indicators, populations which continue to decline, minority ratios which continue to increase, and city–suburb income gaps which continue to widen. If he is right, wise librarians would not take jobs in Chicago, Philadelphia, Detroit, Baltimore, Trenton or the rest of the cities on the list, for it is extremely difficult to have good public libraries in dying cities. Many cities not yet on Rusk's list will be there soon unless radical changes occur.

Changes in the way government does business are affecting all publicly funded services. To date the threats and promises contained in the efforts to reinvent government have had little impact on public libraries. The principles of this movement have enormous potential for changing the way library services are delivered and paid for. Sooner or later the moving finger will come to us and we will be nudged or required to explore privatization, fees, or competing with the private sector for the right to provide information services to the public.

Finally, in an atmosphere in which increasing tax dollars are being consumed by mandated programs such as health care, social security, and prisons, public libraries must be clear about why they should receive any tax support at all. Probably our traditional language about the value of an informed citizenry will not even earn us a place at the table. Clear understandings about our role as publicly supported distributors of private goods will help. The need for clarification abounds as we tackle the complex policy issues of the appropriate use of private money by governmental institutions, the appropriateness of providing choices for people who would rather pay for some services than wait for them to be provided at no cost, and why we should run our own delivery systems when the private sector can do it better for less money.

Organizational Environments. Urban public libraries are large institutions, and most of them are old institutions. The largest of them, the New York Public Library, will celebrate its 100th year in 1995. Others have already done so. Most of them are not well positioned for the changes which will happen to them in the next ten years.

Unless there are serious funding cutbacks, staff in urban public libraries stay and stay and stay. A recent survey of members of the Urban Libraries Council indicated that almost 40% of the 68 responding libraries believed that in the year 2000 they would still have over 80% of the same **individuals** on their staffs as they have today. Another 37% said 60–80% of the same individuals would still be around. This is bad news only when looked at in relation to the amount of money these libraries spend on staff development. Sixty one percent (61%) of the responding libraries reported spending less than 1% of their personnel budget on staff development last year. Anecdotal information suggests that this is not a case of unwillingness to invest in staff. Rather it is a case of not being able to obtain public dollars for what is seen by many voters as unnecessary. For a profession in the middle of a technological revolution, this is institutional suicide. It is the library equivalent of trying to run nuclear submarines with a crew whose idea of effectiveness is rowing in unison.

Many urban libraries also experience structured resistance to change due to the presence of civil service and union work rules. In the same survey done by ULC, 72% of the responding libraries reported their library employees were subject to either civil service regulation or union contracts or both. Neither of these structures is inherently bad or difficult. When their leadership defines effectiveness as protecting all existing positions and conditions of work, however, they may make responsive change so difficult that the institutions will not survive.

Finally, urban public libraries, like all tax supported institutions, rarely encourage risk taking and innovation. To take a risk implies that the proposed action may fail. The failures which take place in tax supported institutions are often used by the citizens and press to deny credibility and therefore, funding, to the rest of the operation. Experimentation is accepted in medicine, manufacturing, and automobile design, but not in public institutions. One reason NASA must struggle for continuing federal support is that its experiments cost huge sums of money, and fail in public if they do not succeed. Being an alpha site for new technology might be a stimulating experience, but if the library users note that it doesn't all work smoothly, library credibility across the board is jeopardized. Most directors and trustees will not take that chance.

Uses of Statistics. In this challenging environment, as in all environments, there are two fundamental uses of statistics--to provide information to managers about various aspects of the library's services and to describe to the world outside the organization what is being produced for the public's investment in it. As is well known, statistics usually yield information about either the extensiveness, the effectiveness, or the efficiency of services offered.

As has been noted earlier, the absence of statistical information about effectiveness has meant that, when such questions have come from policy makers and elected officials, we have answered either with extensiveness data ("What difference does the library make? We must be doing something right--our circulation went up 3% last year.") or with appeals to commonly held values. We also have very little data about how much particular library services cost to provide.

We have collected statistics about things that are easy to count. We have received money because we received money the year before. This is no longer good enough. We must develop and collect statistics about the things that are important to funders as well as managers, and demonstrate that the money we received last year was used effectively on services that make a difference to the community.

Library Services. The library services addressed in this paper were selected because it is believed that they are the most fundable in the current economic environment. Services to business and job seekers, support to lifelong learners, services to young children, and literacy services are all offered in some way, shape, or form by urban libraries. In a policy environment which emphasizes economic development and investment in children and education, these services seem a place to start to enhance our understandings and documentation about what libraries do, how much they do of it, how effective the services are, and how efficiently they are managed.

I. Services to Business and Job Seekers

Due in part to the selection of libraries' roles in economic development as one of the themes for the recent White House Conference, there is some nation wide data on the various services urban libraries have chosen to provide in this area. The 1991 Public Library Data Service Statistical Report asked all member libraries to indicate which of the long list of possible services in support of community economic development they had chosen to offer. This was a national "first" and it was helpful.

Most of the references in library literature which address this facet of public library service provide similar information with continuing advice about how to decide which services are appropriate for a given community, how to develop them, and what resources are important. Very little information is available about how to evaluate these services, particularly in terms of effectiveness. Quick summaries of recent studies follow.

Foust. Account of state library agency initiative and support for library services contributing to economic vitality in Pennsylvania. Indicators of effectiveness were number of people using WORKPLACE centers and increases in circulation of guidance materials.

Sheridan. Account of economic development potential of libraries in Ohio. Outlined alternative roles libraries could play. No mention of evaluation.

The Bookmark. Entire issue (Fall 1988) on serving business in an information economy in the state of New York. Emphasis on various services provided by various kinds of libraries. Little mention of evaluation or statistics.

Public Library Journal. British account of various roles public libraries can play in economic regeneration. Notes "...almost total lack of assessment of the actual contribution that services made to economic regeneration...." and suggests three possible reasons:

*difficulty of assessing the value of the impact of a piece of information.

*inadequate proportion of limited time and money allocated for assessment of impact, and

*reluctance to intrude upon users by asking them to provide information.

Various Professional News Sources. Accounts of the impact of grant information centers at the Multnomah County (OR) and Toledo–Lucas County Public Library in terms of the estimated money brought into the regions.

Because of their operating assumption that the time of their clients has specific costs associated with it, special libraries have moved further along on the path to demonstrating the benefit of their services to the companies they serve than public libraries have. Publications of the Special Libraries Association (SLA) yield information (Marshall) about user studies which ask whether information received at the library resulted in decisions being handled differently, and anecdotal information (Mobley) on how investments in corporate libraries saved companies money in the long run. Also of note is a paper given at SLA's 1990 conference by Jim Matarazzo, "Evaluating the Company Library," which contained methodologies for determining both costs and benefits of library services.

Suggestion for evaluating services of job and career centers are contained in Joan Durrance's new book, Serving Job Seekers and Career Changers: A Planning Manual for Public Libraries. Details are given of user surveys designed to evaluate helpfulness of service, kinds of help received, resources used, and results. Some guidance is provided on how to conduct interview to assess the impact of services.

Resources Needed. As in almost all areas of public library service, the techniques needed to convincingly demonstrate the extensiveness, effectiveness, and efficiency of public library services which support business and job seeking already exist. As a profession, we know how to do user studies and can include questions which get at the number and type of users who come to the library for reasons related to personal and community economic development. We can measure the circulation of business materials, the use of business databases, and the number of business related reference questions.

In public libraries we are not generally acquainted with strategies available for documenting the economic value of information. We need help here, both in understanding existing techniques and in routinizing them to apply to the kinds of situations which occur in public libraries.

Since much information in this area will be anecdotal, we need guidance in the use of case studies and anecdotal evidence in management. Such information often proves extremely powerful in the political sphere, whether or not it is used "properly." Documentation about how to gather it effectively and systematically would be useful.

II. Life Long Learning

That public libraries are used for life long learning is part of the conventional wisdom about our profession and its institutions. It is certainly true. Exactly what services and products contribute to this use is less clear, and therefore less easy to quantify for either management or public relations purposes. Many people would include the two sections which follow this, Services to Young Children and Literacy Services, as examples of life long learners uses of the library. I certainly do not dispute this, but have chosen to separate theme out in this paper to focus attention on the issues involved in documenting and evaluating them.

Part of the lack of clarity about life long learning services is due to the broad scope of both uses and users which should be clustered under this service umbrella. The homemaker who teaches herself accounting to become treasurer of the PTA is a life long learning user, as is the retired general gathering information for a revisionist history of the Korean Conflict. The father learning about reading disabilities to help steer the education of his daughter is a life long learner, as is the daughter learning how to help aged parents select a good retirement home.

Approaches to collecting even basic extensiveness data in this area are, to the best of my knowledge, limited in recent years to some of the urban library user studies done by George D'Elia in Philadelphia, Minneapolis, Atlanta, and Pittsburgh. Some of the work done through the years by Brenda Dervin on the information needs of urban residents suggest elements that could be measured as libraries evaluate the effectiveness of their services in these areas, but few have been picked up by practitioners. Reasons for this are probably as much about cost as about lack of knowledge or urgency.

Resources Needed. We need a careful conceptual analysis of life long learning services so we can identify units of analysis to count, measure, and evaluate. We need careful language about how people learn from fiction as well as nonfiction, from video as well as from books, and from programs as well as from reading. There is professional resistance to this--or at least an absence of professional support--in part because it does not seem urgent, and in part because the area under this umbrella is where we have deposited rationales for any services we can't put elsewhere. To sort it out suggests that there may be some public library services we should not continue because they simply cannot be justified as responsible uses of public money in these times. This is not a comforting thought to librarians, especially since I suspect some of the services which would be thrown out from under the umbrella are favorites.

Following a conceptual analysis, we need fairly simple methodologies to document the extensiveness, effectiveness and efficiency with which services to life long learners are provided. In addition to documenting and evaluating the segments of service which take place within the libraries, we should identify cost effective techniques for determining learning and information needs of segments of the population, as well as for determining perceived barriers to meeting those needs. I do not know an urban library which would not enjoy a leap in credibility if it could demonstrate that a portion of its collection and services were tailored to meet the **demonstrated** information and learning needs of its various neighborhoods.

III. Services to Young Children

Providing introductions to reading, books, and language for young children is an important and politically popular role for public libraries, urban and otherwise. Historically, however, it has been considered **inherently** so valuable, that attempts to count, measure, or otherwise evaluate these services have been strongly resisted. When articles appear in the literature of children's librarianship, they deal more often with the importance of public library services for young children than with the effectiveness of such services. The recent publication of Output Measures for Public Library Services to Children has begun to soften some of the resistance, but it will not go away any time soon.

Documentation about the strategies that work in increasing children's readiness to read, and that make early reading experiences satisfying, abound in the literature of early childhood education. Two challenges exist for urban library managers. The first is to get such research into the hand and minds of those who administer and deliver services to young children in their libraries. This is not easy, since the historic focus of urban library services to children has been more on the quality of the books than on the development of the children. Things may have changed, but in my library school days one could not find a course which addressed fundamentals of child development, but several reviewed children's literature, story telling techniques, etc. The assumption seemed to be that it was more important to be able to review a book for a journal than to share it with a child.

The second challenge for urban library administrators is introducing the literature about prereading and language development effectiveness and relating it to public library programs. If we really wanted to build a nation of readers, would we depend on a few enthusiastic and competent librarians gathering groups of children about them in public buildings for an hour a week? Some public libraries have clearly realized that story hours are a commonly accepted facet of public library programming, but that alone, they have little lasting impact on a child's language development or reading habits. In addition, those children most likely to participate are those least likely to need such exposure since they are probably in the care of people who already recognize the importance of reading and so make time to bring them to the library.

Resources Needed. We can now measure the extensiveness of public library services to children, thanks in part to the new output measures manual. How widely this will be used will depend in some part on who expects it to be used and asks for the data it enables librarians to collect. To have funding authorities request the results of such measurements would go a long way toward encouraging their use.

The public policy challenge remains the demonstration that public library services to preschoolers and their caregivers enable young children to enter school ready to learn, with good prereading skills in the areas of language and thought development. Little library literature has addressed this. A recent address to the International Federation of Library Associations (IFLA) by then ALA President Marilyn Miller concluded, after reviewing the research on the development of reading skills in young children, that the presence of adult role models and easy access to books both matter. Certainly public libraries can contribute to both of these factors. What we need, however, are a couple of very sound studies which could be replicated locally that identify specific roles for the library and demonstrate the effectiveness of them.

IV. Literacy Services

Again, thanks to the recent White House Conference, the Public Library Data Service collected information on the extent of services provided which relate specifically to promoting or supporting literacy. The 1991 PLDS Statistical Report details who provides what, but does not address how much or how effectively such services are provided.

Most urban public libraries work in cooperation with other agencies in their cities to address literacy concerns. Some are active providers of automation or classes enabling adults to increase their literacy skill. Some have chosen to concentrate on family literacy initiatives. Some libraries provide resources for volunteer tutors, either space, materials, or both.

The most extensive resource for statistical evaluation of adult literacy programs is the relatively recent publication, Evaluation of Adult Library Literacy Programs: A Structured Approach by Zweizig, Johnson and Robbins. While offering excellent and fairly simple methodologies for measuring the extensiveness of collection use, support services, and instruction, little is offered about how to determine if people are actually learning to read. The closest the manual comes is detailing how to measure the percentage of students reaching a program criterion. While under the tent of library sponsored literacy services this may be helpful, outside the tent when funders want to know how many people learned to read, this measure may be of limited use.

Resources Needed. We need many of the same things in this area of library programming that we need in the ones addressed earlier in this paper. We need someone in authority to ask for the statistics we know how to collect. Despite the availability of the Zweizig, Johnson, Robbins manual, there is no national gathering of statistics about adult library literacy programs.

We need knowledge of methodologies from other disciplines that enable us to answer reasonable questions from policy makers and funders. If a City Council wants to know whether to spend its literacy dollars at the library or with a nonprofit literacy provider, no library I know of is prepared to make a case for receiving the funds based on the **results** of library sponsored literacy programs.

Conclusions

Many public, nonprofit, and private agencies are trying address the same needs urban libraries are working to meet in the areas of economic development, life long learning, language and cognitive development in young children, and literacy. Many libraries now understand that they must be able to demonstrate effective, efficient service delivery to continue to get funding for these services, rather than relying on traditional allocations of dollars.

To make informed and effective management decisions, library administrators need to know how much service they are providing, what it costs, and how effective it is. Most of this can be known, utilizing statistical procedures known either within librarianship or in related fields. Allocating the financial and human resources to establish focused services with clear goals and objectives, and then systematically evaluating them will come, however, only when funding or administrative authorities insist on it.

To communicate effectively about the services provided, public library administrators and trustees must be able to demonstrate **in terms credible to funders and policy makers** that they are making effective uses of public funds. Businesses are more viable, people find jobs, adults solve problems wisely, young children get ready to read and learn, and workers are becoming more literate. Growth in this area requires increases in communication skills, including acknowledging the legitimacy of the viewpoint of the questioner, as well as increases in statistical information and effective anecdotal information.

We need national support for reviews of existing statistical techniques and methods to address service effectiveness, we need national authorities to insist on evaluations of clearly focused programs, and we need national distribution networks for information about what we all are doing. There is no longer either the time or the grace to reinvent wheels. We must focus our scarce resources on efficiently managed services that work.

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APPENDIX 1

United States
National Commission
on Libraries
and Information Science

NEWS RELEASE

1110 Vermont Avenue, N.W. Suite 820 Washington, D.C. 20005-3522 202-606-9200

For Immediate Release
28 September 1993

For more information contact
John G. Lorenz

LIBRARY SERVICES POLICY FORUM HELD

Washington, D.C. –

> *"Decisions must be made about what we are learning regarding new technology. Libraries are constantly being redefined. What is it policy makers must know to make important decisions about libraries?"*
>
> **Emerson Elliott, Commissioner**
> **National Center for Education Statistics**

A Library and Information Services Policy Forum, jointly planned and sponsored by the National Center for Education Statistics (NCES) and the U.S. National Commission on Libraries and Information Science (NCLIS) was held in Washington, D.C., on September 23–24, 1993. In addition to Federal officials from the U.S. Department of Education, the Bureau of the Census, NCES, and NCLIS, the Forum involved library administrators, officers of library and information service associations, and library researchers and statisticians.

Speakers at the Forum included Sharon Porter Robinson, Assistant Secretary, Office of Educational Research and Improvement, U.S. Department of Education, and Professor Charles McClure, Syracuse University's School of Information Studies, now serving as Distinguished Researcher at NCLIS.

> *"As we move into an environment where we have to be able to document, validate, and show the impact that we are making, collecting appropriate data and access to that data becomes essential to the well-being of the industry."*
>
> Sharon Robinson
> Assistant Secretary, OERI

Forum participants agreed that the cooperative NCES/NCLIS Library Statistics Program had made great progress since 1988 in developing regularly issued, valid, and reliable data in electronic and printed form for public libraries and academic libraries. Further, Forum participants noted that plans to collect data about school library media centers, State libraries, and Federal libraries were commendable.

Three papers were discussed on critical issues and changes facing library and information services: Impact of Technology on Libraries by Martin Dillon, OCLC; Multitype Library Cooperation by Mary Birmingham, METRONET; and Planning for Education for Library and Information Services Professionals by June Lester, University of Oklahoma, School of Library and Information Studies. In addition, a paper by Eleanor Jo Rodger of the Urban Libraries Council on the economic challenges faced by urban public libraries was discussed to illustrate the need for collecting statistical information to support the development of sound policies relating to all types of library and information services.

Three major recommendations were proposed for future Forums:
(1) that specific and urgent policy issues facing libraries be identified on which research and statistics can contribute policy assistance and resolution; (2) that a national institute be organized and funded to develop such research and statistics on a timely, useful basis; and (3) that economic models and studies be developed that will measure the impact of library and information services on economic competitiveness. It was acknowledged that professionals from other disciplines such as economics and political science are needed to contribute to such research and statistical projects. Planning for a 1994 Forum will incorporate both of these recommendations.

> ***"Improving the national library data machine requires more than tuning and maintenance. The machine needs to evolve according to the different routes that are appearing on the changing library and information services landscape."***
>
> ***Peter R. Young***
> ***NCLIS Executive Director***

The mandate of the National Center for Education Statistics is "to collect, and analyze, and disseminate statistics and other data related to education in the United States and in other nations."

The U.S. National Commission on Libraries and Information Science, represented at the Forum by Elinor Swaim, Vice Chairman, is a permanent, independent agency of the Federal government charged with advising the Congress and the President on matters relating to national and international library and information services policies and plans.

APPENDIX II:

"*LIBRARIES AT LARGE*"

TRADITION, INNOVATION, AND THE NATIONAL INTEREST

The Resource Book Based on the Materials of the
U. S. National Advisory Commission on Libraries
1969
(Excerpt, page 518–520)

FEDERAL INSTITUTE OF LIBRARY AND INFORMATION SCIENCE

> RECOMMENDATION: Establishment of a Federal Institute of Library and Information Science as a principal center for basic and applied research in all relevant areas.

The National Advisory Commission on Libraries recommends that a Federal Institute of Library and Information Science be established to become a principal national center of research on library and information science in all aspects. The Institute should have as one of its major responsibilities the system engineering and technical direction involved in the design and implementation of an integrated national library and information system, but the mission of this proposed Institute must range beyond matters of technological development and application to research into the changing needs of information users and the effectiveness of libraries and information systems in meeting these needs.

This recommendation is based on the striking contrast between the serious inadequacies of the nation's libraries and the rapid progress in the technology of information transfer. One of the great challenges of our day is to apply new technology to the operations of our libraries and thereby give each individual in our society easy and comprehensive access to the information resources he needs to make his work competent and his life meaningful.

The Commission recognizes that this goal will not be achieved by a single sweeping innovation, but rather by a succession of technical advances, some already within reach, others attainable by short–term efforts, and some approachable only through prolonged research activities. The times at which elements of new technology are introduced into specific libraries will also vary with the type of library service. Books and card files will be the mainstays of most small libraries for many years to come, but the large research libraries and a few special libraries will press for the earliest possible exploitation of new developments. Ultimately, the new technology will provide effective links from all information resources to all information users.

The uses of microfilm and document copiers are already familiar to every serious library user, even to some elementary school pupils. In the near future, gradual reduction in the costs of microfilm duplicates and full–size paper copiers will make on-demand duplication compete even more with traditional circulation of books and other materials in responding to many kinds of readers' needs. At a later time, as communication costs come down, we shall also see a more extensive adoption by libraries of telefacsimile transmission to distant users.

Of greater potential importance for future libraries than any past technical innovation will be the utilization of high–speed digital computers and their associated information–handling equipment, for the employment of computers in libraries has already led to high hopes for improved access to informational resources, in spite of the exponential growth of knowledge. Computers will most likely be applied to library operations in three successive stages. The computer has already demonstrated its usefulness as a rapid and efficient accounting device for the control of such library functions as acquisitions, circulation, serial records, and binding, as well as for general business operations; this is the first stage. Second, we are witnessing the initial successful attempts to apply the computer to bibliographic operations. The third and most exciting stage of computer involvement, which we are only beginning to approach, is the interaction between the library and the on–line computer community, in which a time–shared central computer is used as a general intellectual tool by many users, working simultaneously at different terminals in a network. Development work is now in progress on the transmission of bibliographic data in such networks and on the more formidable problem of storing and transmitting the full text of documents.

In the course of time, different local networks will be interconnected and we shall see the emergence of regional, national, and international information–transfer networks. What we know today by the term "interlibrary cooperation" will be superseded by a much more fluid pattern of providing access to distant users without preventing concurrent access by local users. The evolution of these networks is the brightest promise of the new technology for libraries, but there are many technical, economic, and other problems that must be resolved before such networks can be operational.

The realization of all that is implied in this array of new technology can be achieved only by a substantial program of research and development. This Commission urges that the Federal Government should actively promote research and development in all aspects of technology as it relates to libraries and information transfer. To this end, the proposed National Commission on Libraries and Information Science should develop an integrated plan of support and cooperation involving the various Federal agencies now sponsoring such research and development work. Such a plan would greatly aid the continuation and strengthening of the current grant and contract program, which involves research and development projects at universities, private and public libraries, nonprofit research and development organizations, professional societies, and private companies.

The major Federal Institute recommended by the National Advisory Commission on Libraries can play an important role in the over-all plan. This Institute should itself undertake multidisciplinary research, development, and prototype application of all types of new technology as they relate to library and information science activities. Its program should be built on a foundation of basic research efforts directed toward better tools for the analysis of library and information requirements, quantitative measures for judging the value of existing systems and services, and an understanding of the relative value of various information-transfer media and of the role of interactive systems.

Supported by such basic investigations, the major research and development activities of the program should aim for further multidisciplinary efforts to improve library work -- for example: (1) through applications of new technology for purposes of saving labor, improving speed and accuracy, maximizing convenience and dependability, reducing costs, and performing tasks previously impossible; (2) through more effective devices for organizing, storing, transmitting, displaying, and copying information; (3) through more effective organization of manpower and service units; (4) through superior understanding of the theoretical foundations of library work and of the storage, organization, and communication of knowledge; (5) through understanding, based on comprehensive studies of both users and nonusers of libraries, both as to their library requirements and also the reasons for nonuse; and (6) through the resolution of legal problems, such as those relating to the photocopying of copyrighted material.

The apex of the overall plan for research and development should be a system of interconnected libraries, established as a prototype network, a model for information transfer by advanced techniques. Such a network, after attaining full operational success, would become the first step in the evolution of an integrated national library system. The National Advisory Commission on Libraries recommends that the proposed Institute should be given the system engineering and technical direction responsibilities for the design and implementation of such a system.

In all planning of technological applications in library work, in all library network or system planning, a crucial element is the development and application of national standards for the compatibility and convertibility of data systems and techniques among libraries. The proposed Institute should take a leading part in bringing about such standardization.

Administratively and organizationally, the Government can choose among many different patterns in establishing a research and development Institute of the type here contemplated. It is recommended that this Institute be established within the Office of the Secretary of Health, Education, and Welfare. It may be helpful to point out that the models that were prominent in the Commission's thinking were the National Institute of Health and the National Laboratories of the Atomic Energy Commission.